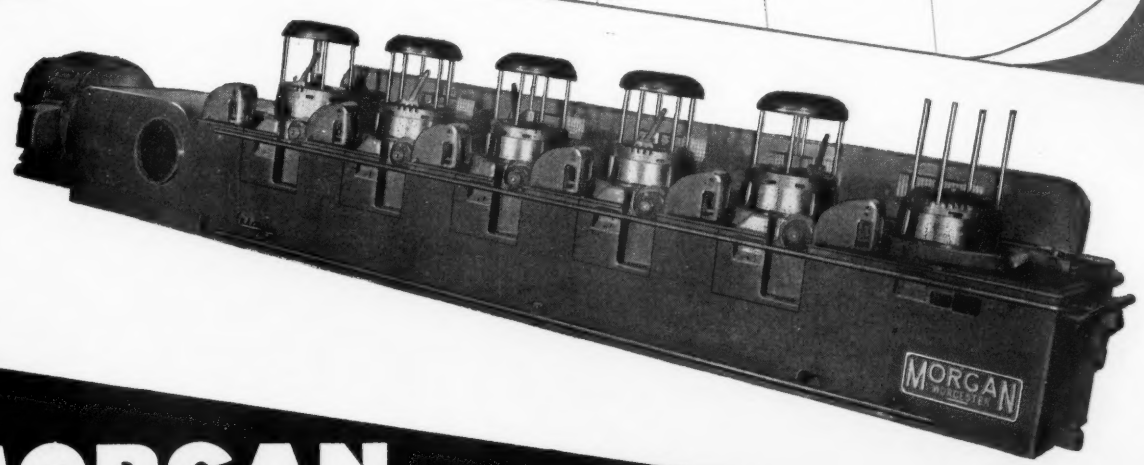
JUNE 1950

WIRE AND WIRE PRODUCTS

June 1950

SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY

This Month
Let's find out what
effect Morgan-Connors would
have on our Costs



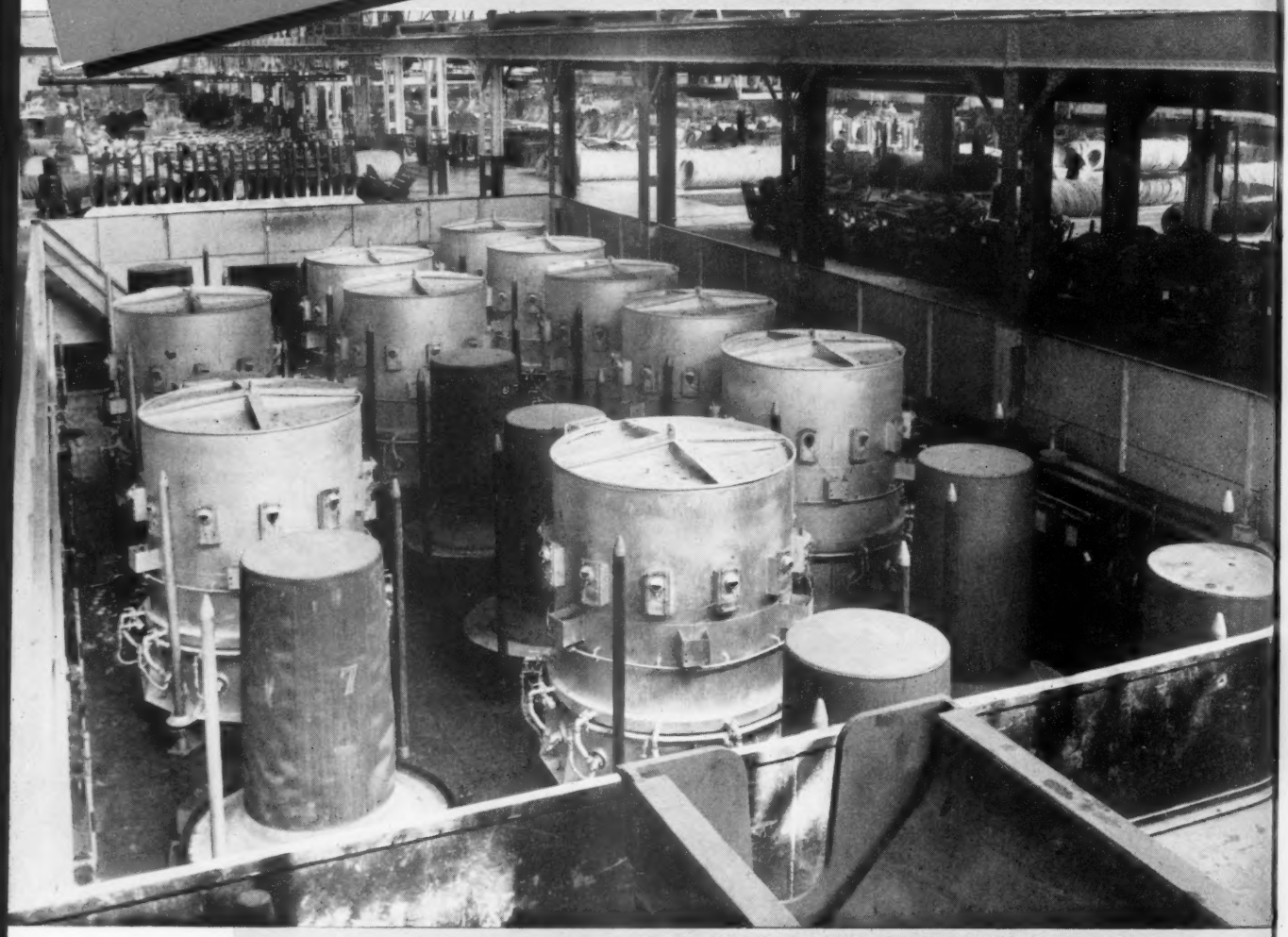
WM 48

MORGAN
CONNOR
WIRE MACHINES

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

Lee Wilson ROD COIL *Spheroidizing*



This photograph shows an installation of 10 Wilson Rod Coil Spheroidizing furnaces in a plant of a large producer of this product for cold heading operations. Starting from ONE unit in 1940, this installation grew steadily throughout the intervening years until it reached its present size in 1949. Growth through performance, is a characteristic of the world wide use of Wilson Wire and Rod Annealing equipment.

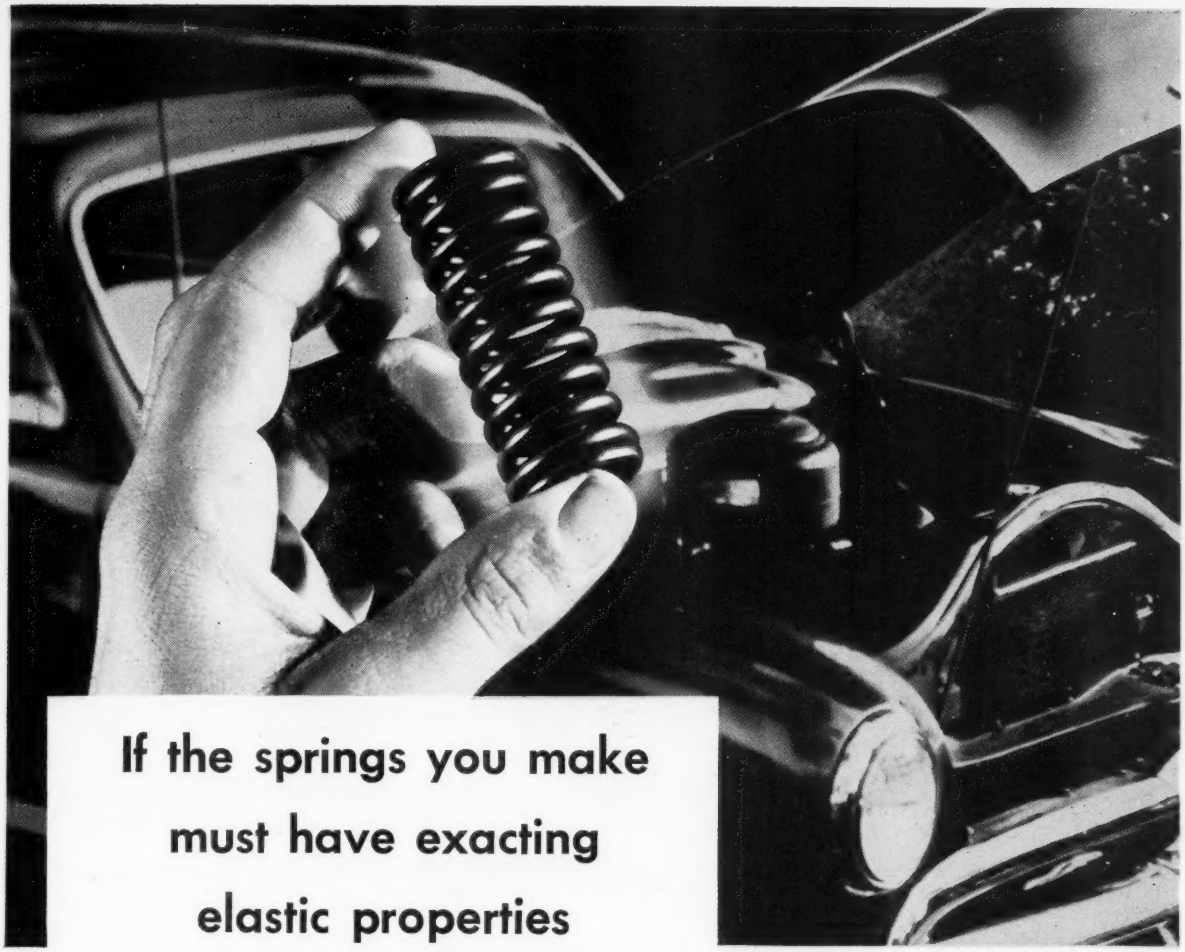
ENGINEERED AND CONSTRUCTED BY THE

LEE WILSON ENGINEERING *Company, Inc.*

20005 West Lake Road CLEVELAND, OHIO

Telephone ACademy 4670

INDUSTRIAL FURNACES • RADIANT TUBE HEATING • HEAT TREATING PROCESSES



If the springs you make must have exacting elastic properties

make them of Amertemp Wire!

SPRINGS headed for a service life that calls for exacting elastic properties? They'll live up to expectations if they're made of U·S·S Amertemp Wire—a high-quality oil tempered wire.

Also for applications where performance will be under high stresses . . . or in places where springs must have the ability to withstand deformation—you'll find Amertemp ideal.

Amertemp is carefully produced under a process which gives it truly outstanding quality . . . exceptional uniformity in gauge and grain structure.

As the world's largest manufacturers of oil tempered wire, we feel qualified to answer any questions you might have on your use of Amertemp. The services of our engineers are freely at your disposal.

And remember—we can supply Amertemp NOW—in mill quantities.

If you use oil tempered wire use—U·S·S Amertemp!

USS

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

We make them all

Perhaps not one of these identification tags describes the kind of steel wire that's best for your requirements. Although there are countless applications for the common types of wire, more and more specialty grades are being used today. These have been developed with specific end uses in mind. They have properties that help wire processors to cut production costs and to improve the performance and sales appeal of wire products.

Your own uses may call for one of our standard grades or a special-purpose type of steel wire. Either way, you can count on our paying strict attention to the important details in turning out a top-quality product in our modern wire mills.

In just the past few years we have made real strides forward in perfecting various specialties in steel wire. Perhaps you'd be interested in some of these. Our engineers will be glad to contribute their experience to any problems you may have in the selection and processing of steel wire.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

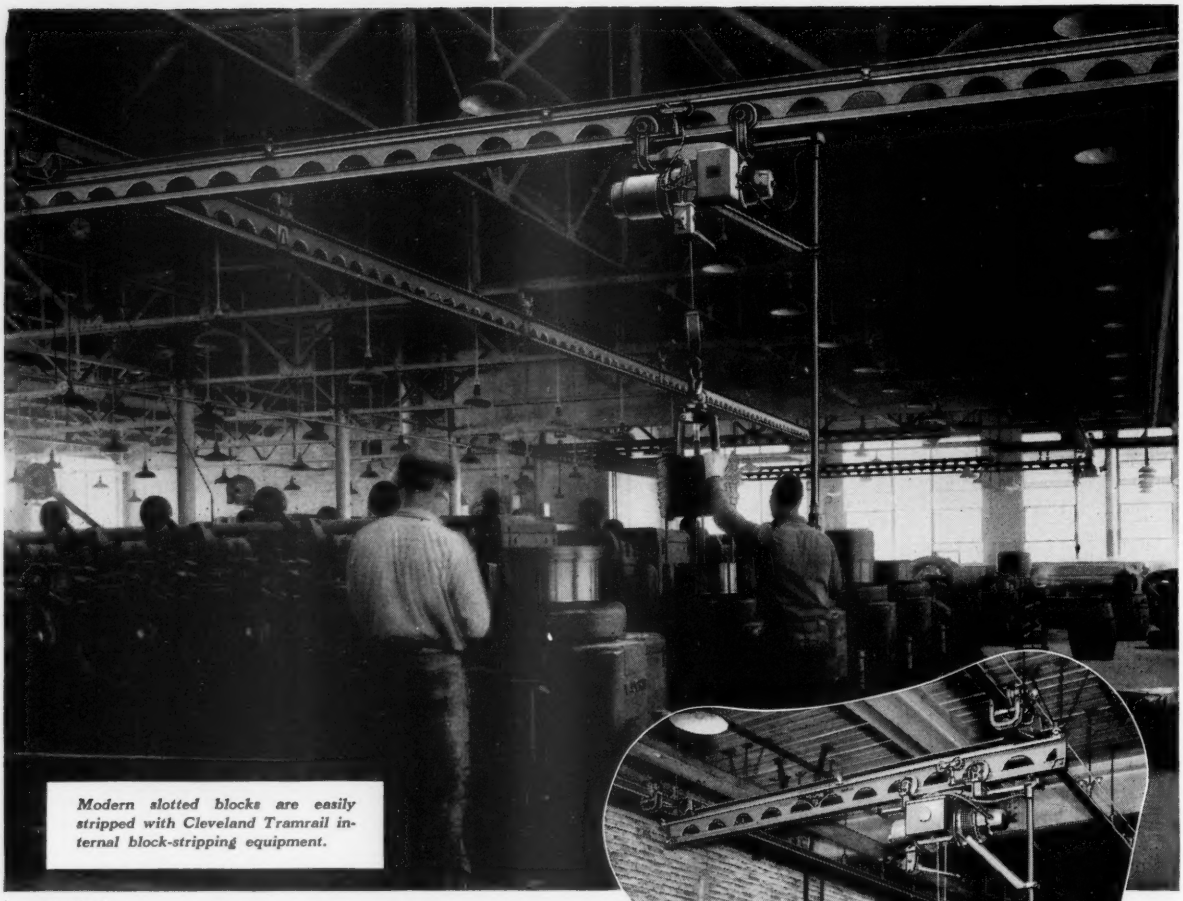
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation.

BETHLEHEM WIRE

BETHLEHEM STEEL

WIRE & WIRE PRODUCTS, Vol. 25, No. 6, June, 1950. Publication Office, at One Sherman Ave., Jersey City 7, N. J. Executive Office 300 Main Street, Stamford, Conn. Published monthly by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secy. and Treas. Subscription price: U. S. $5.00; Canada, $5.00 per year; 50 cents per copy; Foreign, $7.50 per year. Entered as second class matter, January 10, 1949, at the Post Office, Jersey City, N. J., under Act of March 3, 1879.

patent applied for
another SYNCRO FIRST*
*eliptical bobbin openings for
HIGH SPEED
TUBULAR STRANDERS
Faster, practical operating speeds have been proven by the increased demand and installation of this improved type of Tubular Strander. PIONEERED BY SYNCRO — This equipment is being used extensively for the production of ACSR — COPPER and STEEL STRAND. Tubular Stranders are manufactured in various models to accommodate 6" - 8" - 12" - 16" and 22" diameter bobbins. Consult us on your requirements.
Machinery for the Wire Industry
SYNCRO MACHINE COMPANY • PERTH AMBOY • NEW JERSEY • USA

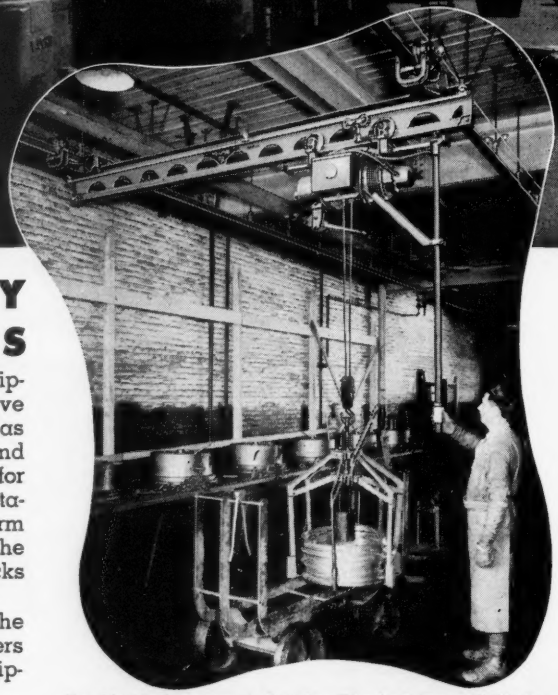


Modern slotted blocks are easily stripped with Cleveland Tramrail internal block-stripping equipment.

The FAST, EASY WAY OF STRIPPING BLOCKS

With an overhead Cleveland Tramrail block-stripping crane or carrier, it's a fast, easy job to remove wire from wire-drawing blocks. This equipment has been especially designed for the work by Cleveland Tramrail. The carriers are equipped with rigid arms for easy pushing of carrier and bridge. A push-button station is conveniently located in the lower end of the arm for instant operation of the electric hoist. If desired, the hoists may be mounted on a turn-table to serve blocks on two sides of an aisle.

For many years, Cleveland Tramrail has been the leading supplier of block-stripping cranes and carriers to the wire industry, for both internal and external stripping. Hundreds of such units are in operation.



For blocks that are not slotted a Cleveland Tramrail block-stripping crane with external stripper makes it a simple task to remove the wire.

GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
9215 EAST 288th STREET, WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Heading
your production
costs
DOWNWARD
FIRTH-STERLING
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QUALITY
Firthaloy
COLD HEADING
DIES
bring real savings to Bolt, Rivet and Screw Manufacturers because they assure:
• Accurate Fit . . . tolerances can be held closer on longer production runs.
• Less Wear . . . which eliminates excess material on blanks, and increases the life of thread-roller dies.
• Longer Life . . . delays bell mouth formation and reduces machine idle time and waste.
Call Firth Sterling
STEEL & CARBIDE CORPORATION
McKEESPORT, PA. • NEW YORK • HARTFORD • PHILADELPHIA • PITTSBURGH • CLEVELAND
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7 Reasons why mills use Talide Rolls

Talide Work Rolls

Solid Carbide Rolls
(weighing up to 1000 pounds)
for Strip or Sheet

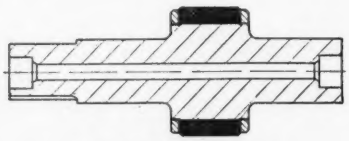
1. MORE PRODUCTION
2. BETTER FINISH
3. HIGHER SPEEDS
4. LESS DOWN TIME
5. CLOSER TOLERANCE
6. GREATER REDUCTION
7. FEWER REJECTS

● Profitable, increased tonnage with Talide Carbide Rolls can be had Mills regularly report astounding new figures. What's more, increased operating speeds and improved surface finish make subsequent polishing and buffing unnecessary.

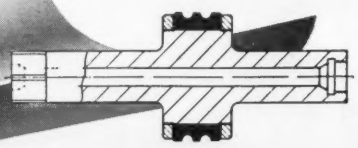
Talide Tungsten Carbide Rolls are used for ordinary finish or mirror-finish on such items as cold rolled stainless, spring steel, razor steel, alloys, carbon, aluminum foil, tinsel ribbon and flat wire.

Metal Carbides Corporation originally developed the art of making Carbide Rolls, and only this firm makes solid or sleeved Talide Carbide Rolls weighing up to 1000 pounds. Available in diameters up to 10" and lengths up to 40". We make the smallest and largest rolls in the world!

Write us today. We'll show you how to get *more production, better finish, higher speeds, less down time, closer tolerances, greater reductions* and *fewer rejects* on your mill operations



Sleeved Rolls for Flat Wire



For Shape Wire

SINTERED CARBIDES
METAL CARBIDES CORPORATION
TALIDE
YOUNGSTOWN, OHIO.
HOT PRESSED CARBIDES

METAL CARBIDES CORPORATION

YOUNGSTOWN 5, OHIO *Pioneers in Tungsten Carbide Metallurgy*

CUTTING TOOLS · DRAWING DIES · WEAR RESISTANT PARTS

ALUMINUM LASTS

. . . gives your wire goods extra sales appeal

This is no ordinary garden fence. It will never need painting during the owner's lifetime . . . because aluminum lasts.

In hundreds of products, people have come to learn that aluminum means no painting, no repairs, no replacement for years and years.

You can incorporate this highly salable advantage into your wire goods with Alcoa Aluminum Wire. Forming is easy on your present equipment. Finishing can be eliminated altogether. And pound for pound, you'll find Alcoa Wire goes three times as far as heavy metals . . . an added savings to consider.

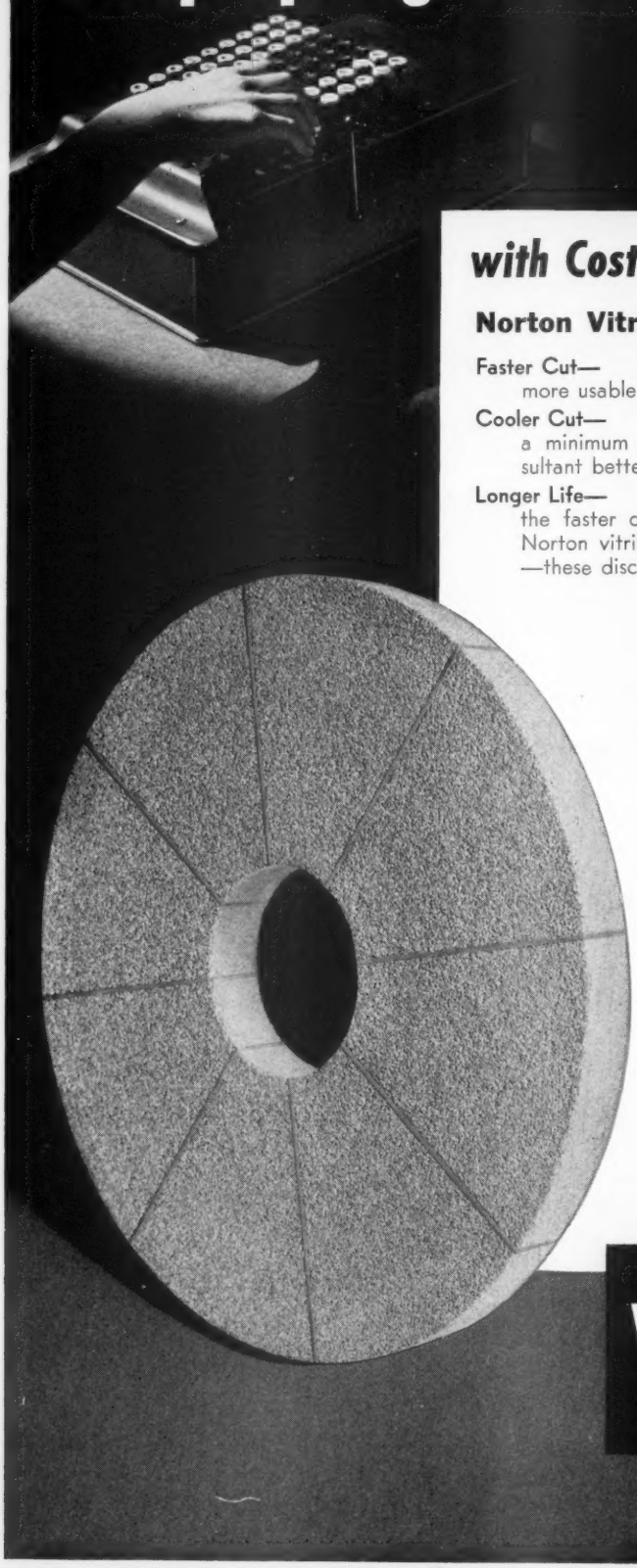
For complete information, call your local Alcoa sales office. Or write: ALUMINUM COMPANY OF AMERICA, 1950F Gulf Bldg., Pittsburgh 19, Pa.

ALCOA FIRST IN **ALUMINUM**

ALCOA ALUMINUM

INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT-MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS • SCREW MACHINE PRODUCTS • FABRICATED PRODUCTS • FASTENERS • FOIL • ALUMINUM PIGMENTS • MAGNESIUM PRODUCTS

Keep Spring Grinding Costs DOWN



with Cost-Cutting NORTON *Discs*

Norton Vitrified Discs Offer:

Faster Cut—
more usable springs per hour

Cooler Cut—
a minimum of burrs, burning and distortion with resultant better quality

Longer Life—
the faster cutting action and more durable bond of Norton vitrified discs means less dressing is necessary —these discs last longer

Uniform Grinding Action—
the same fast, cool cutting action from each disc throughout its entire life — discs not affected by coolant, aging or storage conditions

PLUS Lower Initial Cost—
vitrified discs cost substantially less than resinoid discs

Because They Contain:

The Right Abrasive—
fast, cool cutting 32 ALUNDUM, or sharp, tough 57 ALUNDUM abrasive; **the Right Bond** — vitrified; **the Right Grain Size; the Right Grade; the Right Structure**— open or "P" type; **the Right Type of Mounting.**

Take Advantage of Norton Service: Let a Norton abrasive engineer study your spring grinding jobs. He'll take into consideration the type of grinder used, the method of operation, the material ground, the size and shape of the work, and the finish desired. Then he'll recommend a disc of exactly the right combination.

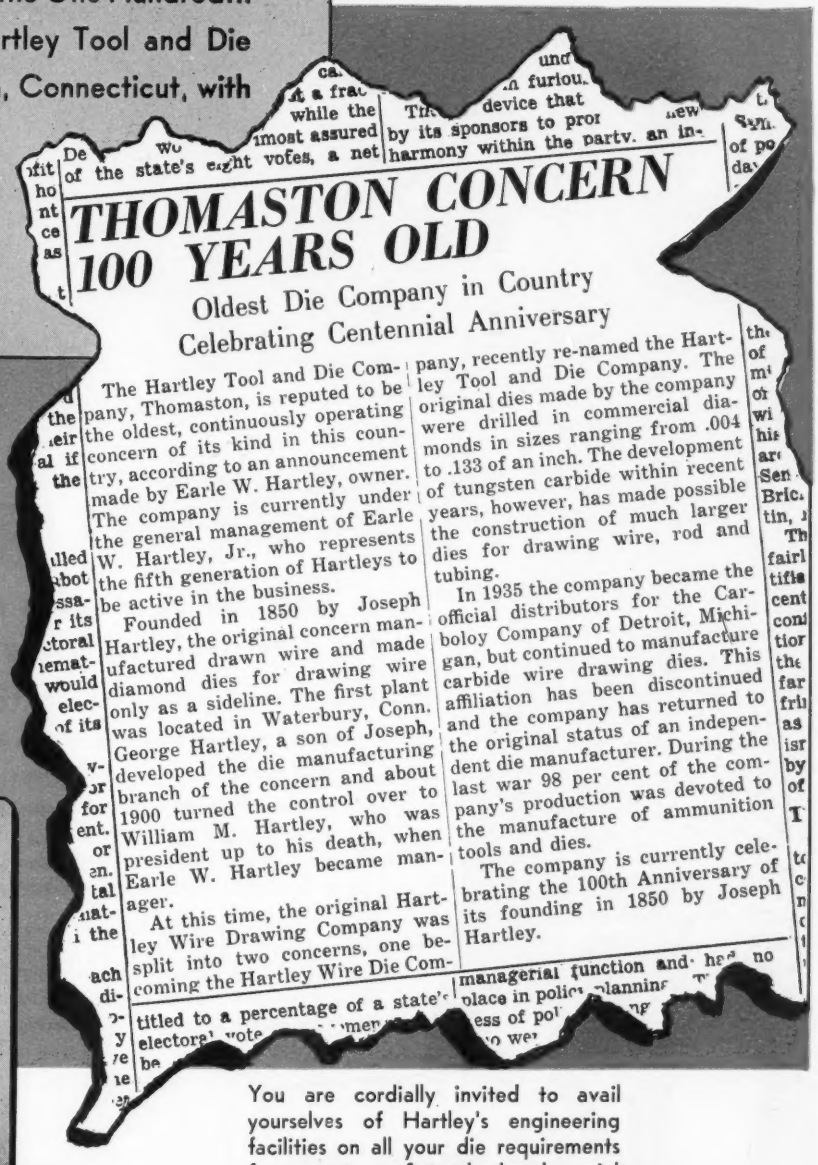
NORTON COMPANY • WORCESTER 6, MASS.
Distributors In All Principal Cities

W-1307

NORTON
ABRASIVES

A CENTURY OF SERVICE TO WIRE MILLS . . . . . .

This year of 1950 marks the One Hundredth Anniversary of the Hartley Tool and Die Company in Thomaston, Connecticut, with the fifth generation of Hartleys carrying on the traditions of service and progress.



THOMASTON CONCERN 100 YEARS OLD

Oldest Die Company in Country Celebrating Centennial Anniversary

The Hartley Tool and Die Company, Thomaston, is reputed to be the oldest, continuously operating concern of its kind in this country, according to an announcement made by Earle W. Hartley, owner. The company is currently under the general management of Earle W. Hartley, Jr., who represents the fifth generation of Hartleys to be active in the business.

Founded in 1850 by Joseph Hartley, the original concern manufactured drawn wire and made diamond dies for drawing wire only as a sideline. The first plant was located in Waterbury, Conn. George Hartley, a son of Joseph, developed the die manufacturing branch of the concern and about 1900 turned the control over to William M. Hartley, who was president up to his death, when Earle W. Hartley became manager.

At this time, the original Hartley Wire Drawing Company was split into two concerns, one becoming the Hartley Wire Die Company, recently re-named the Hartley Tool and Die Company. The original dies made by the company were drilled in commercial diamonds in sizes ranging from .004 to .133 of an inch. The development of tungsten carbide within recent years, however, has made possible the construction of much larger dies for drawing wire, rod and tubing.

In 1935 the company became the official distributors for the Carboloy Company of Detroit, Michigan, but continued to manufacture carbide wire drawing dies. This affiliation has been discontinued and the company has returned to the original status of an independent die manufacturer. During the last war 98 per cent of the company's production was devoted to the manufacture of ammunition tools and dies.

The company is currently celebrating the 100th Anniversary of its founding in 1850 by Joseph Hartley.

Yankee skill and ingenuity have made Hartley wire dies a product of steadily improved quality at steadily reduced prices. Experienced craftsmen assure you of consistently uniform quality.

WATCH FOR THE HEART ON *Every* DIE

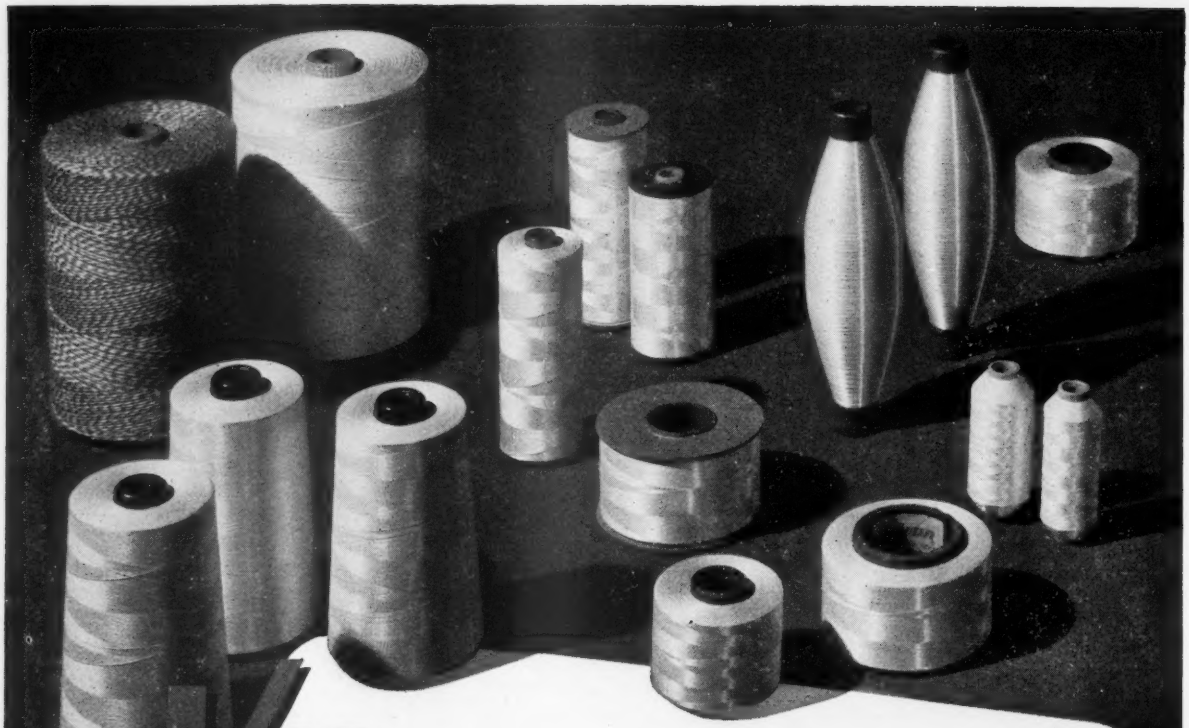
your assurance of highest quality and service

L E Y

TRADE MARK REGISTERED

You are cordially invited to avail yourselves of Hartley's engineering facilities on all your die requirements for every type of standard and special CARBIDE DIE.

HARTLEY
TOOL & DIE COMPANY
THOMASTON, CONNECTICUT
Telephone 625 - 626



Vitron GLASS YARNS

In a full range of types and packages for electrical insulating applications

Here are the Performance Properties of VITRON

- high strength
- withstands 1000° F.
- dimensionally stable
- excellent electrical properties in minimum space
- absorbs no moisture
- resistant to rot, mildew, oils and most acids
- easily impregnated or coated

Will these qualities improve your product? If so, we'd like to help you profit from them.

Vitron Glass Yarns are being used by leading processors*

- to form long-lived magnet wire insulation
- to braid sleevings, tubings, wire and cable jackets
- to reinforce high dielectric plastic laminates
- to provide high strength low cost cable tension members (using either all Vitron yarns or a combination of Vitron and jute yarns)

Vitron yarns are available not only in standard continuous filament 450's, 225's and 150's but also in a new low-twist 300 which has helped magnet wire producers to cut costs more than 20% below previously used 900 and 450 yarns. Write for information and engineering consultation.

*Names on request

Vitron®
GLASS FIBER
ELECTRICAL INSULATING MATERIALS

GLASS FIBERS INC. · WATERVILLE, OHIO
PHONE: WATERVILLE 2201

Isn't this a pretty kettle of fish?

SURVEYS reveal an appalling misunderstanding among young people of the "facts of business life." For example, a poll was made among seniors in certain high schools which showed that they believe business profits are "over 50%" of the sales dollar, where actually profits average less than 8%. These students also think that stockholders receive 24% of the sales dollar, where actually it runs less than 3%.

Isn't this a pretty kettle of fish?

A greater part of the 8% of the sales dollar is reinvested in the business to expand and improve plant facilities which protects employment and creates new jobs for more workers.

Such ignorance is alarming. It is unfair to the young people themselves and dangerous to America's furture. Such misconceptions open the door to socialism, communism and all the fantasies of the handout or "something-for-nothing" state of the economic dreamers.

Our school teachers say they *want* authentic information on the business system and how it works. Only business itself can supply the facts. You as a business leader in your commuuity must share the responsibility for this misunderstanding. It is our civic duty to help overcome this misconception of everyday economics in the minds of our youth today.

THE YOUNGSTOWN SHEET & TUBE CO. 1900 YOUNGSTOWN 1950 50 YEARS OF SERVICE

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio

Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES.

Cut Production time 50% by swaging cables

SWAGING MOVIE AVAILABLE

Shows how swaging permits improved grain structure, tensile strength, elasticity. This 16 mm., 26-minute sound motion picture available free on request. Write us direct.

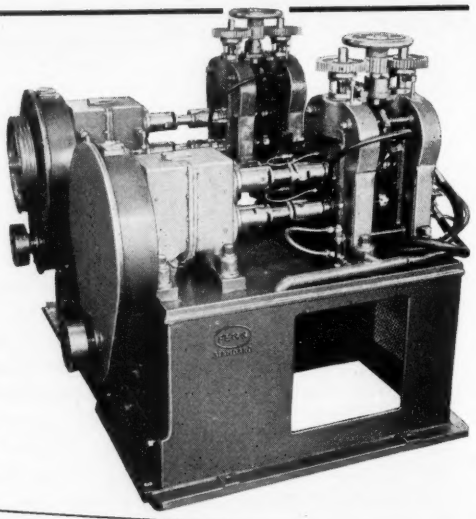
No more need to waste valuable production time by soldering or splicing cables to fittings! Performance records show an actual saving of 50% when these old style methods are replaced by swaging.

Fenn-Standard Rotary Swagers can be used for attaching almost any shank, ball, or barrel type fitting to wire cable. Swaging saves material, saves labor—does not require skilled operators. What's more, swaging improves the physical characteristics of the metal itself. It cold flows the metal of the terminal into the interstices of the strand or cable on which it is swaged. This makes the swaged fitting stronger than the cable itself!

Prominent users of Fenn-Standard Rotary Swagers include aircraft manufacturers, repair depots, elevator and hoist equipment manufacturers. The automotive industry, too, finds cable swaging the efficient answer for attaching brake, cowl and seat cables.

For complete information on Fenn-Standard Rotary Swagers see your nearest Fenn dealer or write us direct.

Cut costs, increase output with Fenn-Standard wire flattening mills



Flatten wire in one pass at 50 to 2000 feet per minute! With Fenn-Standard Tandem Wire Flattening mills, you can handle ferrous or non-ferrous alloys and stainless steel rapidly to close tolerances. Cut costs substantially below equivalent work done on single stands. Save on handling, use fewer operators.

These well known mills provide the most efficient wire flattening method known. Modern design, careful engineering, generous dimensions of parts and close tolerances account for their performance. Require minimum maintenance over a long service life. Available in tandem units up to 5 on a single stand or base with roll diameters from 3.5" to 12" to cover the entire range of wire sizes.

Fenn-Standard Machines Are Sold By:

Charles Taolin
Providence 3
Indianapolis Machinery Export Co.
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Maxwell Roney, Inc.
New York
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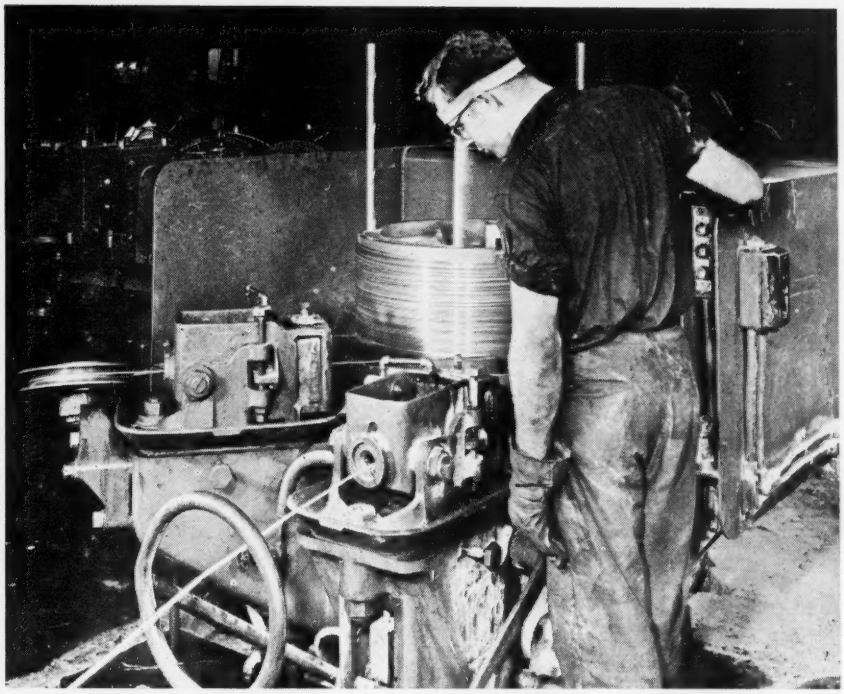
THE FENN MANUFACTURING COMPANY
1853 Broad St., Hartford 1, Conn.

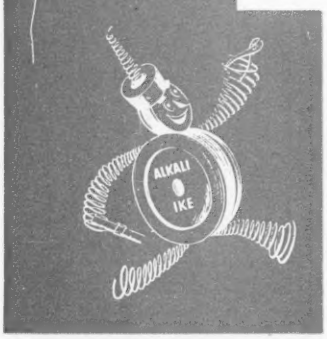
FENN-STANDARD MACHINERY

FENN

Shaping metal for better and stronger products at lower cost



You are looking for CLEANER BRIGHTER wire...



Apex 550 insures:
Cool dies
No dust
No waste

We have the answer!

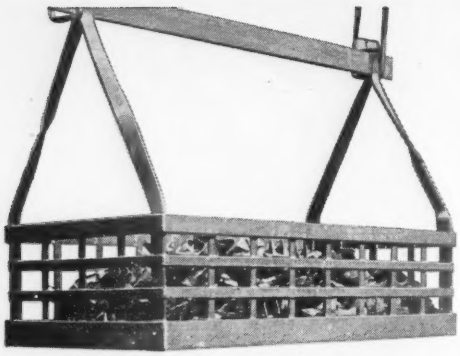
APEX 550 DRAWING GREASE

WILL GIVE YOU SUPERIOR FINISHES ON ALL TYPES OF WIRE

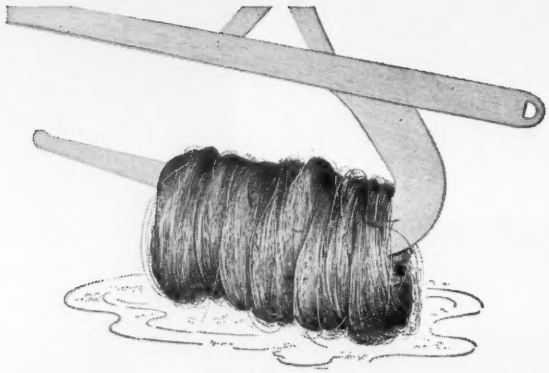
For a sample of this drawing grease, just drop us a line...we'll be glad to send enough for a real trial.

Apex Alkali Products Co.

MAIN & RECTOR STS., PHILADELPHIA 27, PA. • PHONE: IVyridge 3-3939

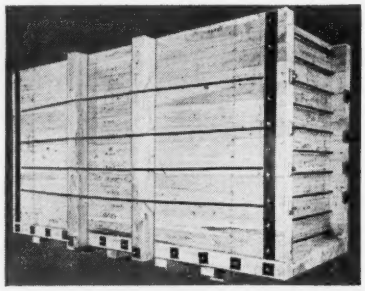


Monel basket, replaced a wooden unit of the same exterior dimensions, and approximately doubled the load capacity.



Monel hook . . . still in service after 3½ years . . . has already given 6 times the best service life of other metals.

For Baskets . . . for Hooks For Tie-rods . . . for Crates The Metal is Monel



Monel tie-rods actually help wooden tanks last longer.

If you have a steel pickling operation in your plant, you have a job for Monel®.

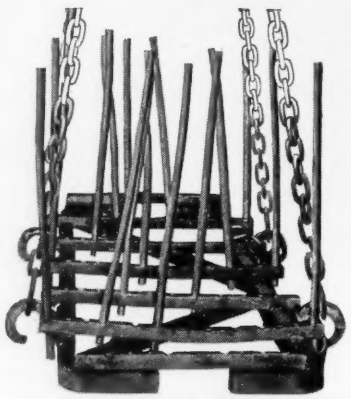
No other metal offers so many advantages for steel pickling service; meets all your needs so well.

First, of course, you need resistance to corrosive pickling acids. *You get it with Monel.* Many long-service records are your proof.

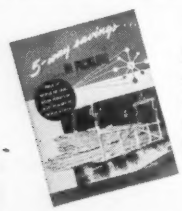
Then, you need a metal that is strong, tough and ductile. Strong, so that thinner sections can be used to minimize deadweight. Tough, so that shocks can be safely absorbed. Ductile, so that there is less chance for sudden, dangerous failures. Again, *you get all these properties with Monel.*

Monel gives you maximum versatility in design, too. Working with the large variety of wrought mill forms available, fabricators can produce the exact equipment you need. Equipment specifically designed to do *your* job best.

Remember Monel next time you order pickling equipment. Monel is adaptable to all pickling requirements. It is used for baskets, crates, racks. For hairpin hooks, tie-rods, nuts and washers. For all types of chain and accessories.



19-year-old Monel crate . . . and still on the job.



SEND FOR NEW BOOKLET! It shows how Monel equipment can make your pickling safer, more efficient, more economical. For your copy, or for more information on Monel and Monel fabricators, write to our Ray Reddell.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N. Y.

EMBLEM OF SERVICE INCO TRADE MARK

Monel PICKLING EQUIPMENT

extra life
extra capacity
extra safety

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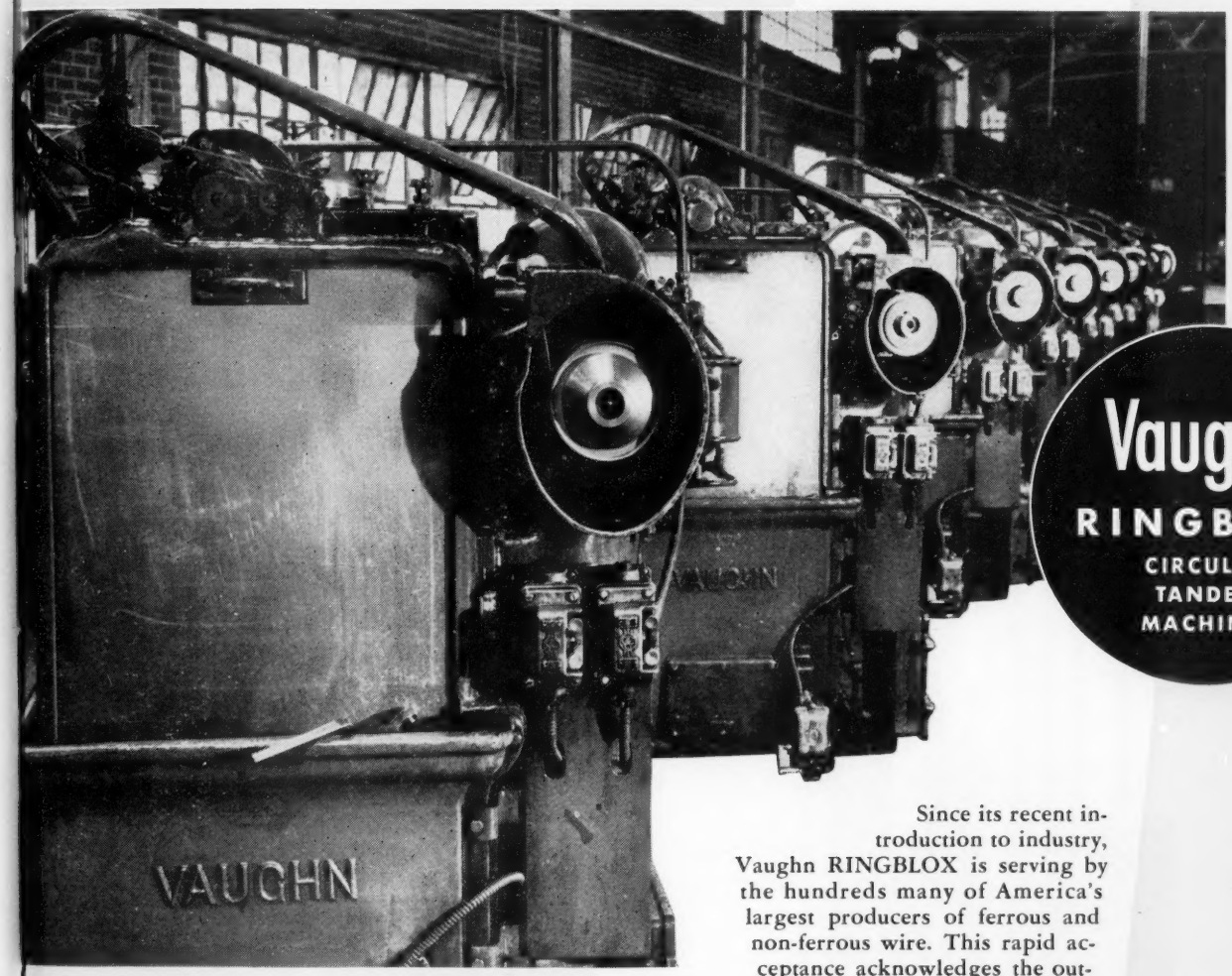

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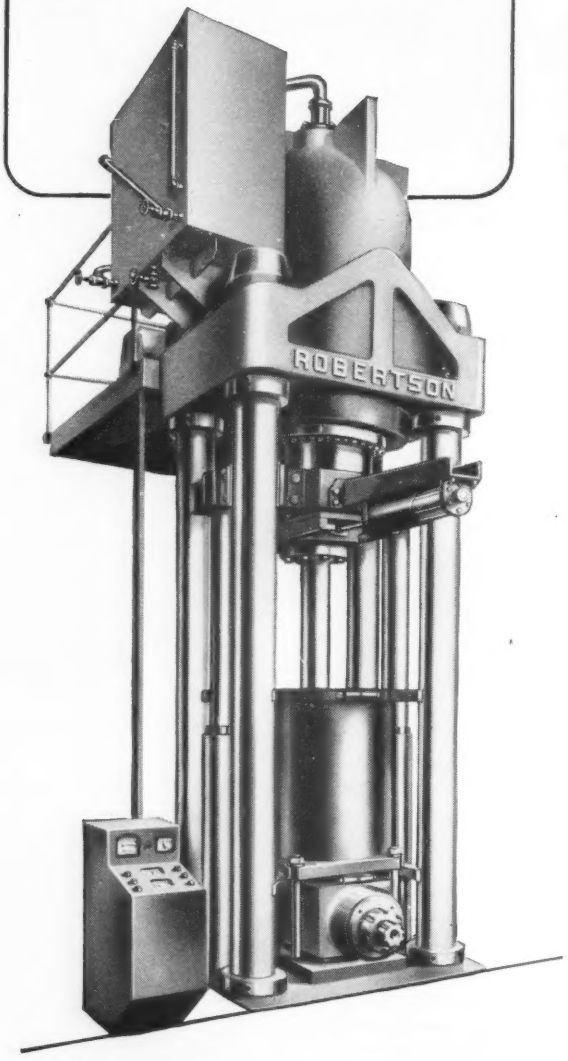

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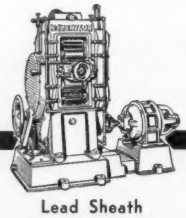

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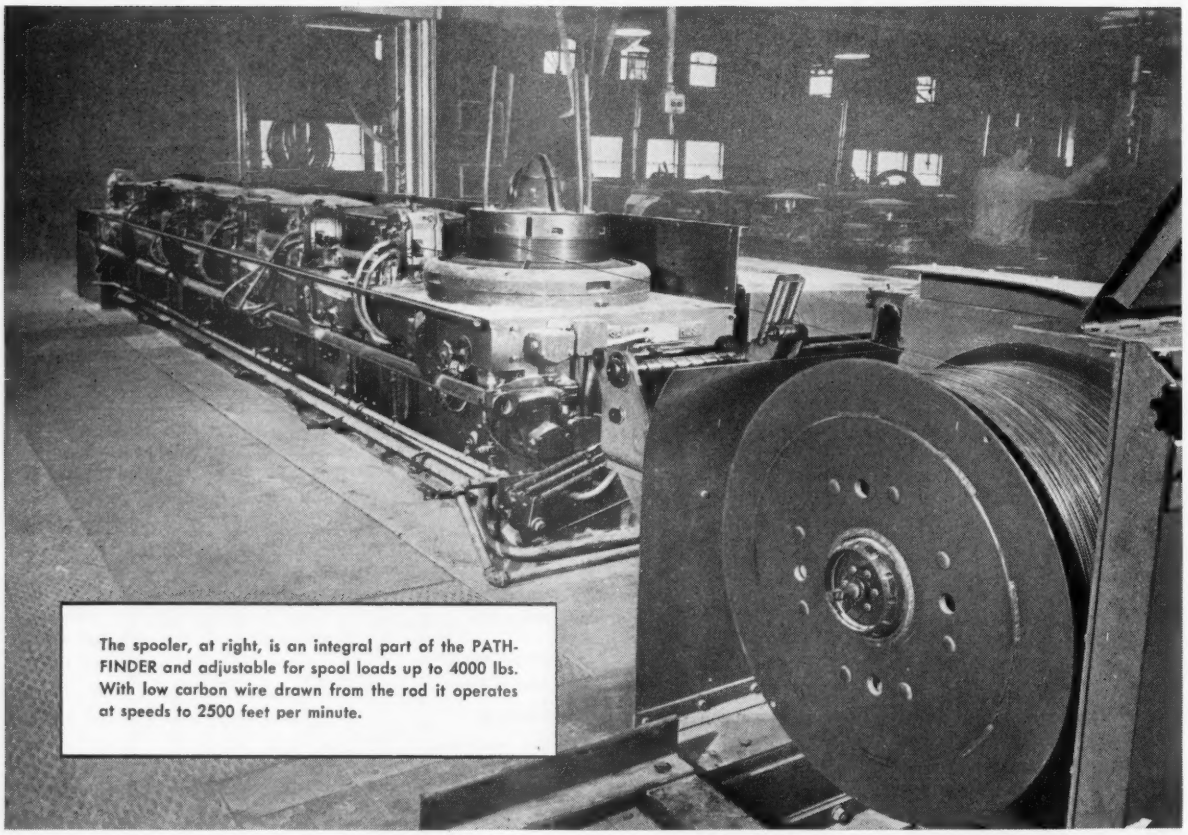

The spooler, at right, is an integral part of the PATHFINDER and adjustable for spool loads up to 4000 lbs. With low carbon wire drawn from the rod it operates at speeds to 2500 feet per minute.

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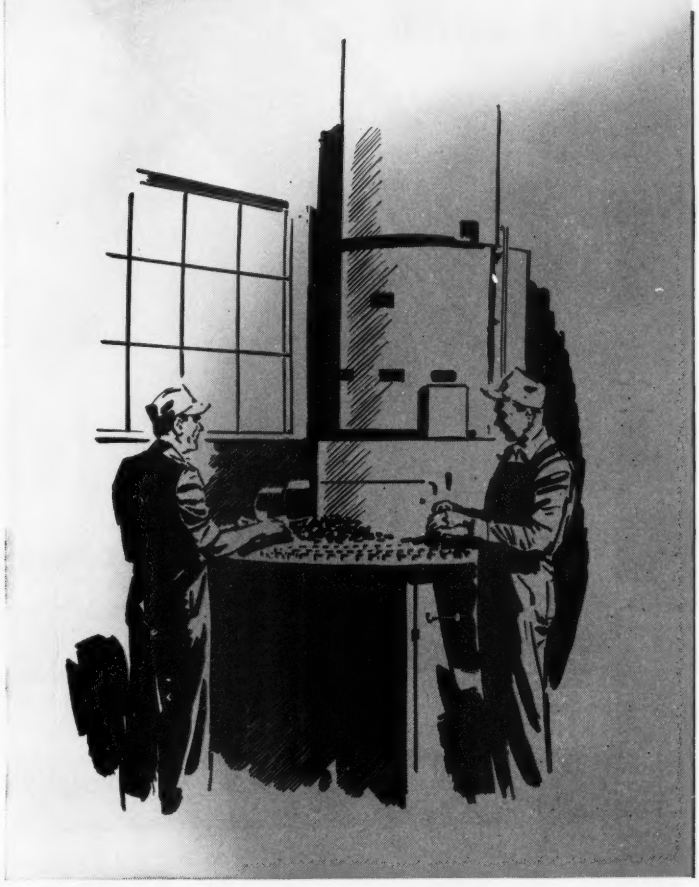

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Roebling has one of the largest specialty wire mills in America. From steel-making to finished wire, Roebling techniques and the most modern precision machines ever built assure a product that is always uniform in mechanical and metallurgical properties . . . that saves you preparation time and brings faster, smoother operation!

Have your Roebling Field Man help you choose the Oil-Tempered Spring Wire—or other round, flat or shaped wire—that will be best for your product and your production. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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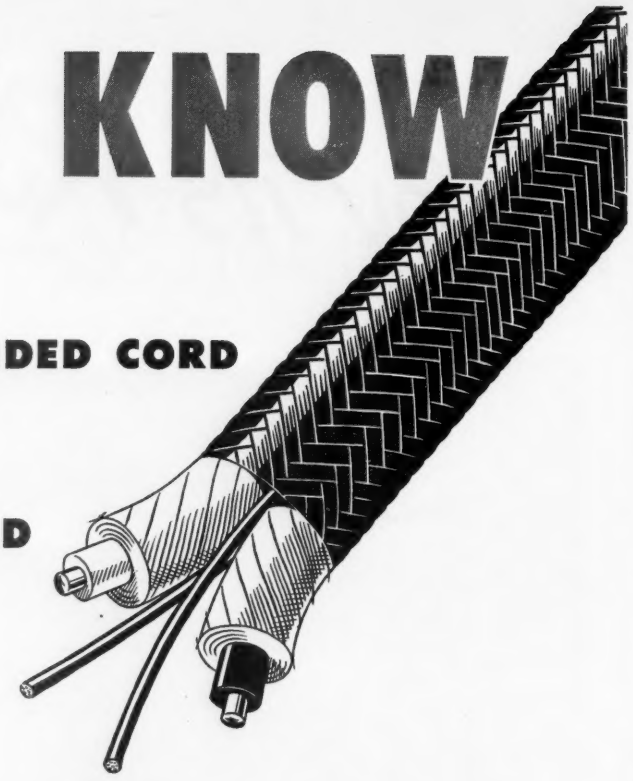
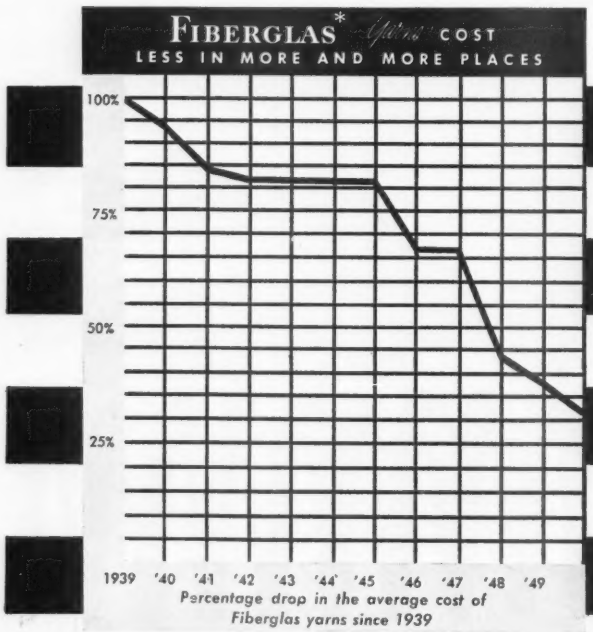


...BECAUSE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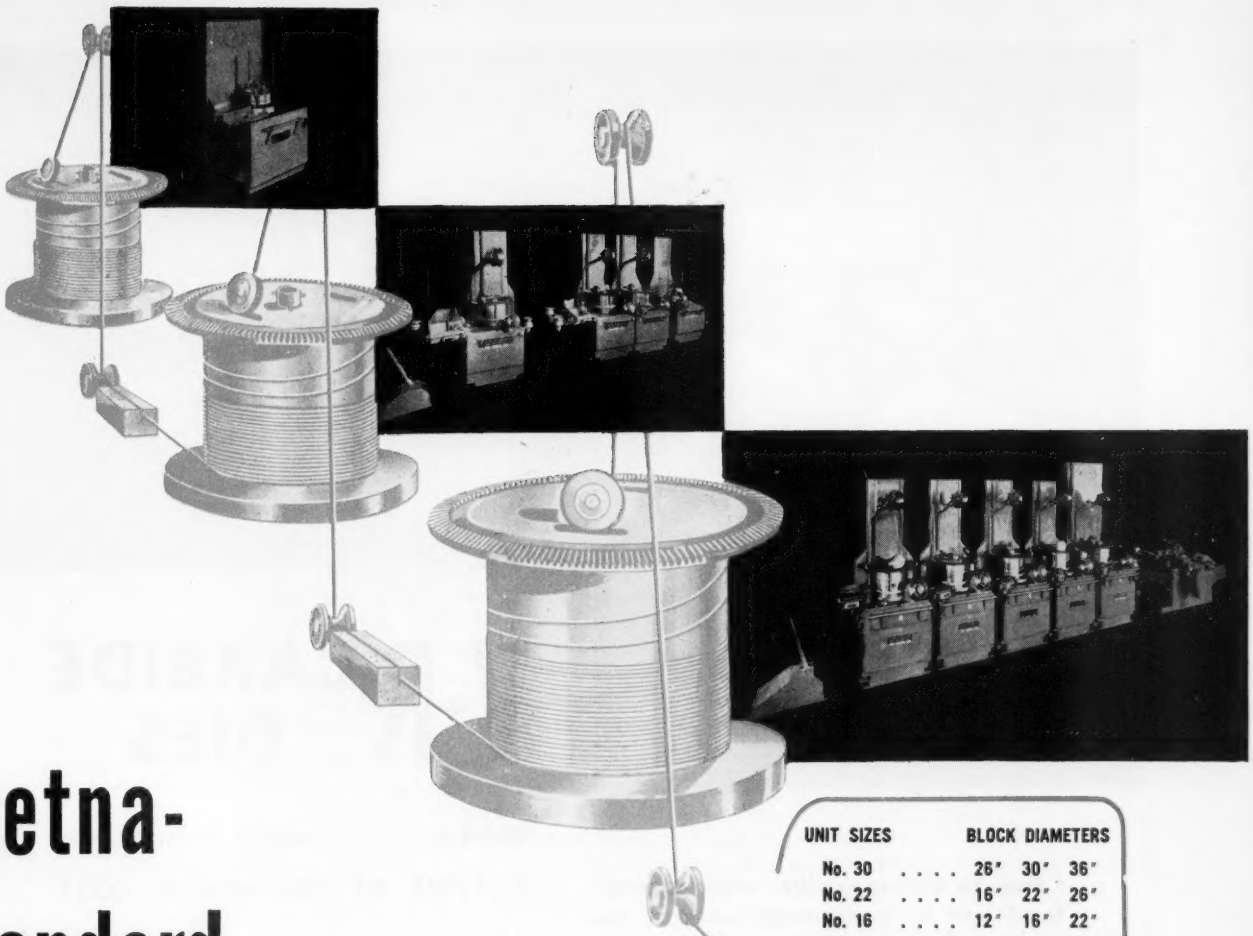

Aetna-Standard Wire Drawing Unit

UNIT SIZES	BLOCK DIAMETERS		
No. 30	26″	30″	36″
No. 22	16″	22″	26″
No. 16	12″	16″	22″
No. 12	8″	12″	16″

● **Profitable Production**—Aetna-Standard Vertical Wire Drawing Machines are engineered to most effectively utilize the elements of labor, time, and space. Compact, sturdy construction assures long service at maximum production with a minimum of maintenance.

Efficiency and economy are inherent characteristics of Aetna-Standard construction. Proper arrangements of units to fit your production requirements can make every unit a continuous producer.

Tonnages are increased to a new level through Aetna-Standard design. Controlled water cooling of both dies and blocks, improved die boxes and holders, and auto-rheostatic synchronization between units all contribute to ease of operation and increased production.

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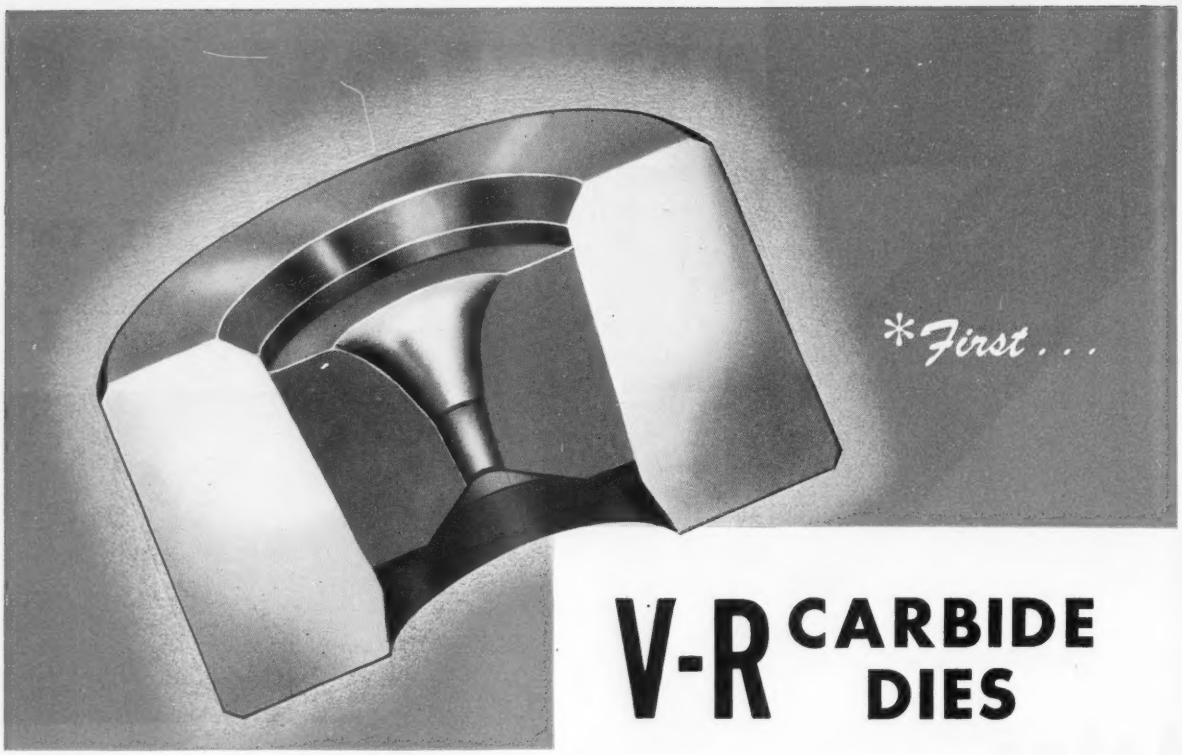

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***mean* . . . high tonnage output at minimum cost**

V-R Carbide Dies combine every advantage known to the wire industry.

V-R Carbide Dies, R-1 thru R-6 with the NEW higher nibs are completely redesigned to improve drawing conditions and to allow for heavier drafting practice.

Eliminate unnecessary maintenance and cost NOW by changing to V-R Carbide Dies—The World's Finest!

*** First to develop extra wide tapered front and back openings for easy inspection and maintenance. No steel to cut when resizing or refinishing V-R Dies.**

*** First to design and develop the tapered nib construction increasing internal strength and providing perfect die concentricity.**

*** First to manufacture Carbide Die with preformed rough cored back relief to eliminate costly die room coring operations over the entire range of hole sizes.**

*** First to furnish Carbide Dies rough cored to finish, at hole sizes below .015". These rough cored dies are available in dies sizes R-O, R-1, and R-3, rough cored at .004" and .010".**

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The Wire Outlook

About ten or twelve years ago the United States was considered to be a country of declining population. Official estimates in 1938 put the top population growth at a probable 140 million. This year's Census will show that we have 152 million citizens and prospective ones. What happened? When we entered World War II marriages skyrocketed; so has the birth rate. For the past 10 years the accretion has been at the average rate of 1,700,000 a year. All this has a bearing on our future markets. It means to us that more wire and wire products will have to be made and more machinery will have to be added to produce them.

This is interesting because the Federal Trade Commission still feels that steel expansion is not keeping pace with population growth. Capacity is known to be well in excess of consuming power so far. We venture to opine that future expansion will follow any definite need for steel without any prompting from the bureaucrats.

We have used 60.9% of our high grade ore deposits and 25% of our medium grade reserves (which is as good quality as either Germany or Japan had to work with at any time). There are immense deposits of taconite (low grade ore) on which steel companies are spending millions to develop processes for their economical utilization. Besides this, large scale titanium production has been practically solved, and aluminum and magnesium are claiming more and more of the steel markets. There are adequate sources for these metals. Private initiative will maintain a good balance of supply—government dictation will only upset it.

A new spiral toward inflation has been started. It may develop slowly, but it is on the way, so that another cycle of price increases is now in the offing. This trend is prompted by Government deficit financing, the Government's policy of encouraging easy credit and the new wage demands of the labor unions. This development places us at an increasing disadvantage with respect to foreign markets and creates a false sense of prosperity. One machinery manufacturer of our acquaintance returned recently from an extensive tour of Europe and the Far East to appraise his foreign markets. His conclusion is that except for E. C. A. financed business, we can expect very little foreign business. Many "backward" countries have developed industrially to an amazing degree, equipped largely with E. C. A. purchased American equipment. From these countries, with their low wage scales, we may soon expect a flood of cheap goods, unless equalizing tariff barriers are set up.

Big-business baiter Celler, chairman of the Monopoly Subcommittee investigating the steel industry, has been considerably deflated. To Celler, bigness is bad per se, but as it is turning out even his colleagues are not supporting his crusade against "bigness." His recommendations will probably be much toned down, if he is to get any support.

Pressure from the automotive industry for springs has been strong and with Chrysler back in production, demand will certainly not be lessened. Farm fencing, including barbed wire, is still in strong demand, although baling wire pressure is experiencing a seasonal let-up. Manufacturers' wire is booking heavily into the third quarter and a general unbalance between supply and demand will extend into September. The same may be said of most merchant products. Cold heading wire orders are holding up, music wire supply appears adequate and some nail schedules have been cut. Fastener makers have around a month's backlog, somewhat up from a month ago. Rod supply is tighter. Manufacturers of many types of wire products report a sharp curtailment of export orders. This is to be expected as our prices advance.

We can expect business to continue at high levels for many months to come. While a major disaster—war or an epidemic—could change our outlook, the horizon contains only the clouds of war, with no immediate prospect of it. May it be avoided through wise statesmanship!

—from the Editor's Desk.

Notice and Correction

The correct dates for the next Annual Convention of the WIRE ASSOCIATION are October 23-26, 1950, at the Lord Baltimore Hotel, Baltimore, Maryland.

In the May issue of Wire and Wire Products the dates were erroneously given as a week earlier.

Please mark the correct dates,
OCTOBER 23rd through the 26th,
on your calendar now—

and make your plans to attend.

An especially fine program has been set up by the Program Committee, including a boat trip down the Patapsco River to Sparrows Point, to the Bethlehem Steel Company's Rod and Wire Mills there.

Full program details later

THE WIRE ASSOCIATION

RICHARD E. BROWN, Executive Secretary

300 Main Street Stamford, Conn.

WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 25 JUNE, 1950 No. 6

Designated as

Official Publication By The Wire Association

Reg. 511,530 U. S. Pat. Off.

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Niles Flanged Steel Traverses are manufactured in a wide range of sizes up to 56" diameter and 48" traverse... in plain, painted and hot dip galvanized finishes. The special "Reinforced Type" has *extra strength* where it is needed most—at bolt holes and base of the flange—yet saves weight through use of lighter gauge steel. Width of flange and number of bolt and drain holes are furnished to your specifications. Available for prompt delivery. Write for prices.

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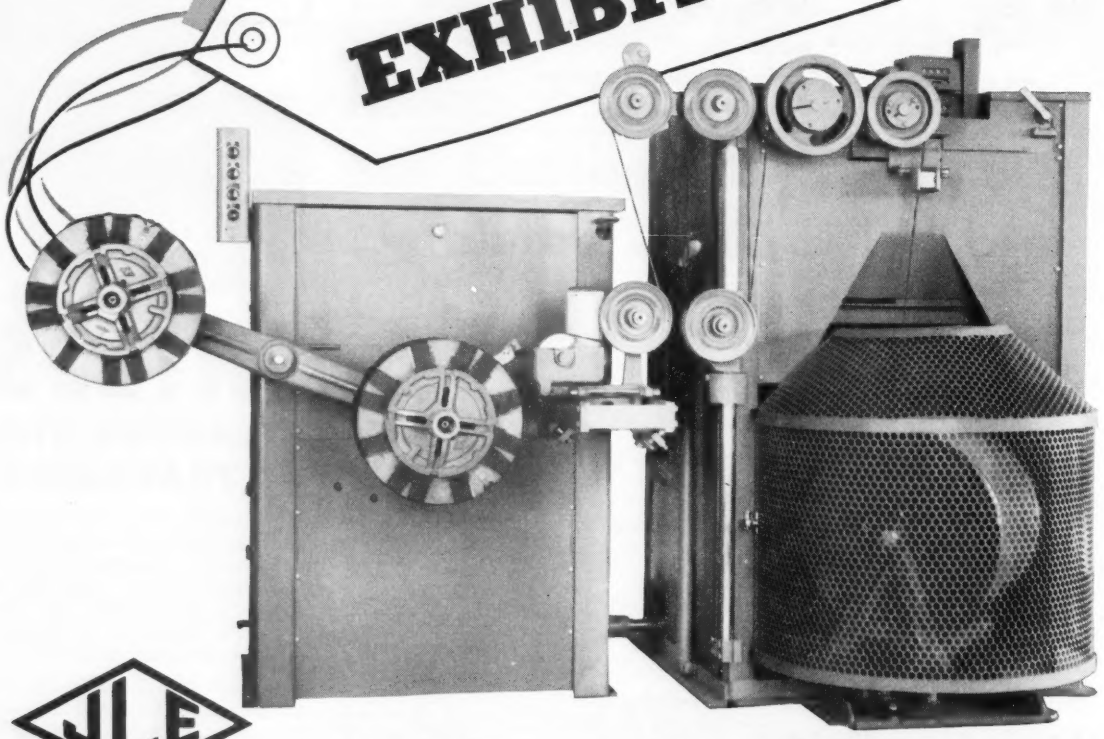

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A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 25 JUNE, 1950 No. 6

Nail Production

By Geoffrey K. Rylands
Rylands Brothers, Ltd.
Warrington, England

This description of the new Nail Department of Rylands Brothers, Ltd., at Warrington is interesting because it not only tells how an ideal plant has been laid out, but how it is operated from a management standpoint. We are indebted to Mr. Geoffrey K. Rylands for a very able presentation of the story of their planning and setting up this valuable department.

SHORTLY before the War we, at Rylands Brothers, were contemplating the complete re-organization of our system of Wire Nail manufacture. With the outbreak of hostilities the work had to be postponed. As soon as the War came to an end, we determined that the work must be put in hand without delay. It was clearly impossible to obtain more than a very limited number of new machines and the Factory had to be planned on the basis of using our existing machines, many of them of great age.

★ ★ ★

EXPERIENCE indicated that the efficiency of Nail manufacture did not depend so much on the actual type of machine used as on the layout and organization of the department. We accordingly concentrated on this aspect of the problem and felt convinced that we could obtain satisfactory results and a substantial increase in output, provided we could arrange for every machine to be overhauled and standardized before installation in the new Factory.

★ ★ ★

AS a result the problem was to some extent simplified since we had not to bother about types or designs of new machines but only problems of layout and handling, and we felt, that if, at some future date, we could replace existing machines with new and better models, this could be done without difficulty and without impairing the organization in any way.

★ ★ ★

General Principles of Layout

THE first essential in all modern factory layout, and this applies with special force to Nail manufacture, is the elimination of "donkey-work" with its consequent inflation of the labour force. This implies the installation of suitable handling appliances, and in order to secure the greatest economy and avoid the duplication of machinery, it is important that the material should be handled in the heaviest convenient units. With this object in view we arranged that wire should be drawn on detachable strippers, so that the coil on its stripper could be conveyed direct to the Nail Department and the stripper placed on a suitable turntable behind the Nail machine. This eliminated the necessity of tying up the coil from the wire-drawing block and cutout the wastage of binders, which, in a production of upwards of 1,000 tons per week is not an inconsiderable item, apart altogether from the labour of putting the binders on the coil and disposing of the scrap binders when they are finally removed. The obvious disadvantage of this system is that the empty stripper has to be taken back to the Wire Mill after use, but this is not an important matter since full strippers are constantly being delivered to the Nail Department, and the same conveyance can return the empty ones.

★ ★ ★

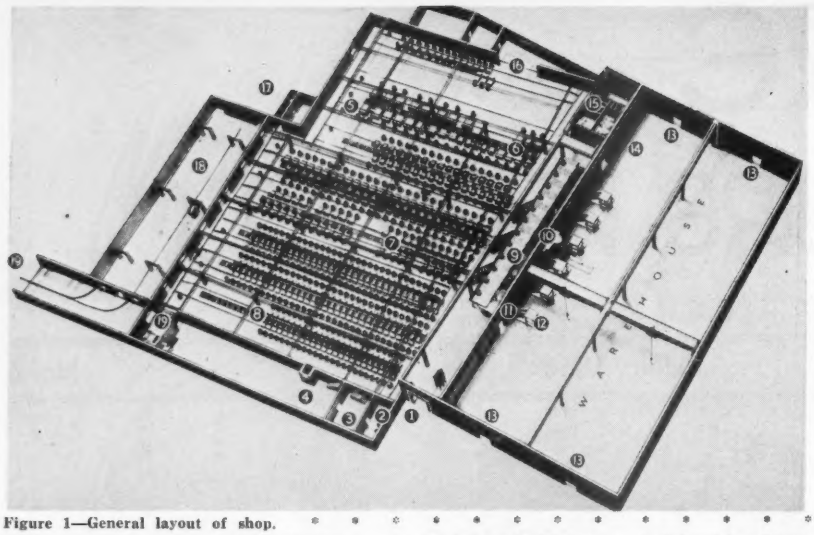

Figure 1—General layout of shop.

1. Entrance
2. Heat Treatment
3. Tool Issue
4. Fitting Shop
5. Heavy Machines
6. Bliss Machines
7. Class 3 Machines
8. Class 7 Machines
9. Polishing Plant
10. Control Room
11. Automatic Weighing
12. Stitching Point
13. Mechanical Loader
14. Cement Coating
15. Foreman's Office
16. Galvanizing Plant
17. Canteen
18. Wire Warehouse
19. Exit

IN order to cut down the number of journeys it is important that the heaviest possible coils of wire should be used. We accordingly standardized on a weight of coil of 18 cwts. to 1 ton for wire sizes 8 gauge and thicker, and 7 to 10 cwts. for sizes as fine as 16 gauge, and 2 to 4 cwts. for sizes finer still to a limit of 20 gauge. As new wiredrawing machinery is installed, coil weights in sizes finer than 8 gauge will be increased. The heavier weight coil has the advantage of giving long continuous runs to individual Nail machines, and reduces the amount of labour necessary in feeding and maintaining them in operation. So far as the finished Nails are concerned, it is convenient to feed these into skips in loads of 20 cwts.—equivalent to a barrel load on the polishing plant. With these conditions in mind the general layout of the shop is arranged so that each type of machine is set out in separate rows with the machines in pairs on either side of a trench. The trench contains 20 cwt. skips between each pair of machines, so that two machines making the same size of Nail feed into the same skip. Behind each machine a turntable is set into the floor, on which the stripper swift can be placed. Overhead cranes are provided which run over each line of turntables and over the centre line of the trench. These are Monorail cranes with power driven traversing and lifting. At each end of the shop there is a transfer crane which enables coils of wire or skips of Nails to be moved laterally across the shop.

Figure 1A—General view of shop from the wire supply end.

★ ★ ★

THE general layout of the shop is shown in Figure 1. and Figure 1A, is a general view of the shop from the wire supply end. The stripper swifts on their turntables are clearly shown, and the grating over the trench containing the skips between the machines is also visible.

★ ★ ★

Types of Machine

MANY different types are at present in use, most of which have been transferred from our original department. In the heavy section Greenwood & Batley, National and Wafios machines are employed. Large head Clout Nails are made on Double Blow Bliss machines and extra large head Felt Nails with swaged shanks are produced on Malmedie A. O. U. machines.

★ ★ ★

REFERRING to Figure 1. (near 16.) there is a short row of Staple machines. These are principally of the presser point type and are mostly of our own design. Next to these are two rows of heavy machines, including the Greenwood & Batley's, the Malmedie A. O. U.'s, and at the far end the Double Blow Bliss machines. The rest of the machinery is engaged on general production of Round Nails with plain or chequered heads and ordinary Clout Nails. The machinery used comprises a battery of old National machines, the remainder being of our own design on generally the same lines as Wafios. At 8. on Figure 1. are the finest machines, producing Nails from 15 gauge and finer, down to 20 gauge Panel Pins.

★ ★ ★

General System of Working

THE wire is delivered into the bright wire warehouse (Figure 1. 18.) by motor lorry or overhead Monorail crane direct from the wire mills. From here the loaded stripper swifts are picked up by Ram truck and parked under the transfer crane adjacent to the row of machines on which the wire in question will be used. From this point the loaded strippers are conveyed by the machine shop Monorail cranes direct to the turntables behind the Nail machines.

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EACH machine is driven by its individual motor with a press button starter, and in view of the low power factor of numerous small motors of this character, an automatic static condenser i s fitted at the end of each row of machines. As explained above, each pair of machines on either side of the skip trench feed into one skip and as soon as the skip is full the machine operator presses a switch which shows a light at his machine and also switches on a red light on the control board in the foreman's office (Figure 1. 15.). The skip-runner on seeing the light at a machine brings the skip hoist to the machine in question, lifts the skip out of the trench and conveys it to the weighing point at the polishing plant (Figure 1.9.). He replaces the grating which comes away with the skip by a light aluminium disc. The machine operator is responsible for placing in a pocket on each skip a card showing his check number, the size of Nail and the group of machines in question. This card is in duplicate.

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WHEN a full skip is removed a slide in the chute from the machine is lowered. This prevents the Nails from falling into the trench. When the empty skip is returned, the slide is lifted and the accumulated Nails fall into the skip. The chute is large enough for the machine to run for at least twenty minutes. Thus the machine need not be stopped when a full skip is removed. (Figure 3.).

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THERE are three weighing points across the width of the polishing plant and the skip of Nails is parked on a roller conveyor behind the weighing machine (Figure 2.) where it waits its turn for weighing off and subsequent transfer to the polishing plant. After delivering the loaded skip to the weighing point, the skip-runner picks up an empty skip from the adjacent roller conveyor and takes it back to the machine from which he removed the full skip. The aluminium coverplate is removed and the empty skip is lowered into the trench.

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Foreman Control

IN a Plant of this size it is considered essential that:

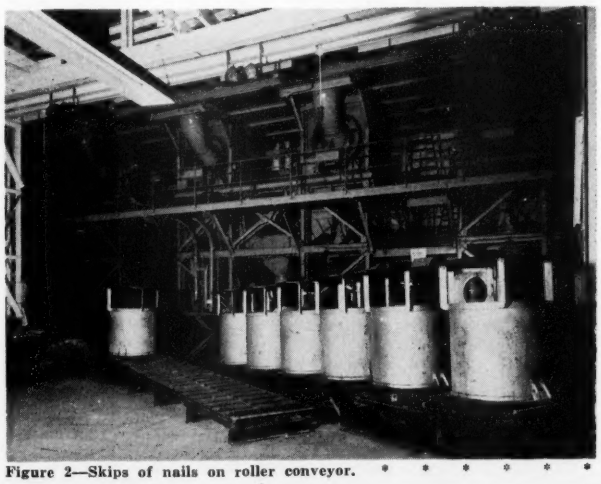

Figure 2—Skips of nails on roller conveyor. * * * * * *

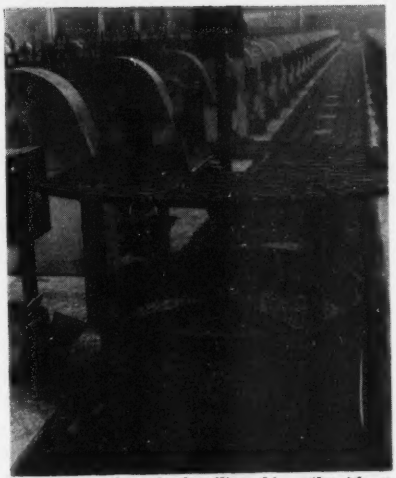

Figure 3—Machine for handling skip nails without stopping when skip is removed. * * * *

1. **The foreman should be able to note any polishing hold-up in the shop from his office.**
2. **That any machine operator should be able to communicate direct with his foreman. With these two essentials in mind the following arrangements were made:-**
   - **(a) When the operator switches on his red light to indicate a full skip a red light is also illuminated on the control panel in the foreman's office. This light is extinguished as soon as the full skip is collected by the skip-runner.**
   - **(b) The operator is provided with a green light at the machine with a corresponding light on the forman's control panel. If the operator requires the assistance of his foreman he can switch on these two green lights.**

The exact location of any hold-up in polishing or of an operator in difficulty and requiring advice is immediately apparent to the foreman who can proceed direct to the locality concerned.

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Polishing Plant

THE polishing plant (Figure 4.) merits a fairly detailed description, since considerable thought

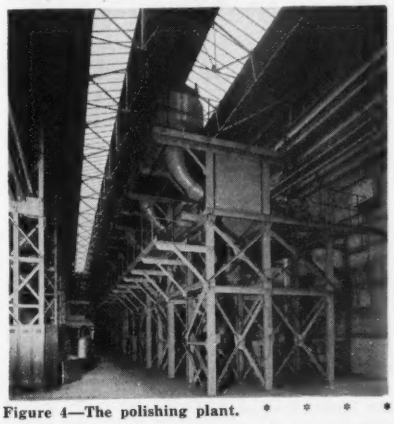

Figure 4—The polishing plant. * * * *

was devoted to its design with a view to cutting out all unnecessary labour. It is probable that, in the old days, the polishing plant absorbed more "donkey-work" labour than any other stage of Nail Production.

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Summary of Layout

IN our Plant the polishing barrels are set in pairs (Figure 5.). They are kept in continuous rotation and the Nails are fed into them through the trunnion at one end (Figure 6.). After polishing they are discharged via hydraulically operated doors, through a vibrator into a rotating perforated drum which separates the chippings and the sawdust. From this drum they fall on to a vibrating table (Figure 7.), which feeds them into an automatic weigh hopper (Figure 8.). At a pre-determined weight the weighing machine stops the vibrator and drops the Nails into a bucket conveyor (Figure 8.). Immediately the Nails have dropped and the doors of the weigh hopper are closed, the vibrating table comes into operation again, the bucket conveyor moves round one space so that an empty bucket is under the weigh hopper ready to receive the next unit weight of Nails.

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Rotating Perforated Drum

REFERENCE has been made to the perforated drum in which

Fig. 6—Feeding Nails to Polishing Barrels thru the Trunnion at one end. * * * * *

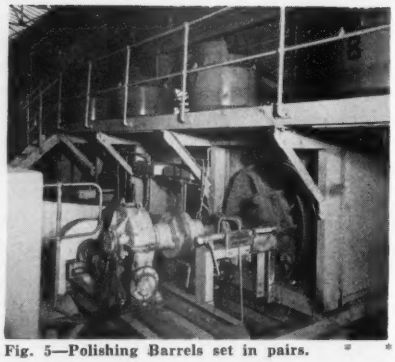

Fig. 5—Polishing Barrels set in pairs. * *

chippings and sawdust are separated from the Nails. A more detailed description of this unit is necessary. The perforated drum is backed by a plate set at such a distance that the Nails cannot fall through the perforations.

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THIS therefore, permits the sawdust and chippings to fall into the annulus between the perforated drum and the backing plate, while the Nails move forward and are finally discharged onto the vibrating table. The sawdust and chippings fall through a chute onto a belt conveyor which carries them to the end of the polishing plant. The sawdust is separated pneumatically from the chippings and discharged into a storage bin, whence it is disposed of as a waste product. The chippings fall off the belt into a boot and are picked up from there in a bucket elevator which discharges them into a bin. From the bin they can be discharged by gravity either into Railway trucks for shipment to the Steel Works or into bags for other purposes.

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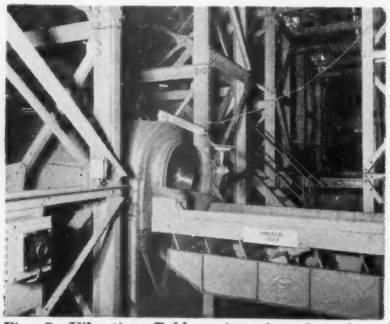

Fig. 7—Vibrating Table. * * * * *

Operating System

WE left the loaded skip of Nails which had been delivered from the Nail machines sitting on the end of the roller conveyor behind the weighing machine. The skip moves forward in turn over the weigh-bridge and the duplicate cards attached to it are stamped by the weighing machine with the weight of Nails it contains (See below). The correct quantity of sawdust for polishing is dropped into the skip when it reaches the end of the conveyor.

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WHEN the loaded skip arrives at this point it is underneath the overhead crane which feeds the various barrels. The polishing controller receives the charge card from the weighing point and then decides into which polishing barrel he will drop this particular charge of Nails and immediately that barrel is available he switches on a light over the weighing point where the skip in question is waiting. He also switches on a light over the barrel into which this skip-load is to be discharged. On receiving these signals the craneman picks up the skip indicated, moves it to the appropriate barrel and lowers it onto the discharge hopper (Figure 6.). As the rim of the hopper takes the weight of the skip the bell-bottom is lowered and the Nails are discharged into the barrel. When the loaded skip was lifted from the weighing conveyor its indicating light was extinguished and a corresponding light over the adjacent 'empties' con-

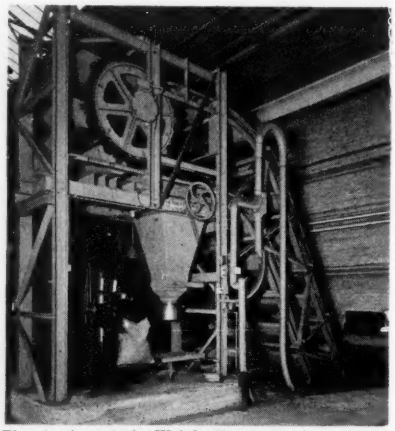

Fig. 8—Automatic Weigh Hopper. * * *

veyor illuminated. This ensures that the cranedriver returns the empty skip to the point whence it came.

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Control Cabin

AT this point some description of the control cabin is necessary, for it is upon this equipment that the whole system of polishing depends (Figure 9.). The cabin is a small sound-proof chamber with windows overlooking the main warehouse. Immediately in front of the controller are six panels, each panel controlling a pair of polishing barrels. In front of these panels are three switches used for signals to the three weighing points and in front of each switch there is a clip which can hold the card applicable to the skip at the weighing point which awaits polishing. On each section of each panel a red light indicates whether that barrel is running. A second light indicates whether or not the barrel can receive a charge. A series of lights on each panel indicate the position of the discharge door, whether it is closed, quarter open, half open, three-quarter open, or fully open. Automatic time dials for each barrel can be set to a pre-determined time for polishing and another dial can be set to a pre-determined time of door-opening. The sequence of operations is then as follows:-

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THE controller switches on the light at one of the weighing points and also the light over the hopper of an empty barrel. The crane discharges the Nails into the barrel indicated. As the skip is lowered onto the hopper it operates two switches; one extinguishes the 'barrel-empty' light, the other illuminates the 'polishing-in-progress' light in the control cabin. Polishing continues in accordance with the pre-determined time-cycle. One minute before completion a warning bell rings. When the time-cycle is complete a white light shows on the appropriate panel indicating that polishing in that barrel is complete. The Nails can now be discharged, provided the other barrel of the pair is not already discharging through the perforated drum and vibrating table and provided also the bucket conveyor is ready to receive the charge. The controller, therefore, presses the button controlling the door-opening and the door will then open automatically a pre-determined amount if all is clear to receive the charge. If, however, the bucket conveyor is already loaded, the door will remain shut until the man on the bucket conveyor presses a button indicating that the conveyor is empty and can receive the next charge. The door of the barrel will then open automatically for a pre-determined time and the Nails will be discharged through the rotating perforated drum on to the vibrating table into the bucket conveyor. When the door-opening time has elapsed the doors will automatically close and the signal

(*Please turn to page 524*)

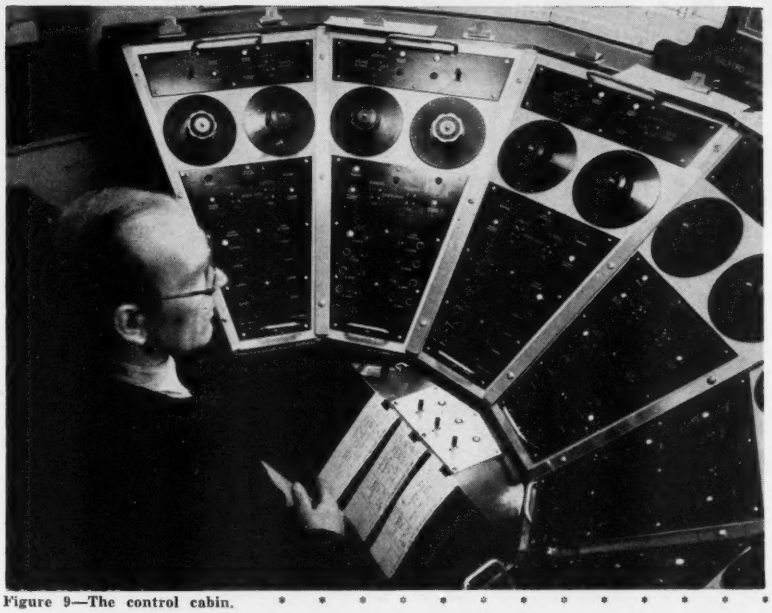

Figure 9—The control cabin.

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NAIL DEPT PRODUCTION RECORD

1. Stitchers
2. Shift
1. Weighers
2. Shift
A. B. C. Stitching Point
D. E. F. Weighing Point

DATE
SIZE & TYPE
M/C CLASS & SECTION
M/C OPERATOR
TRUCKER

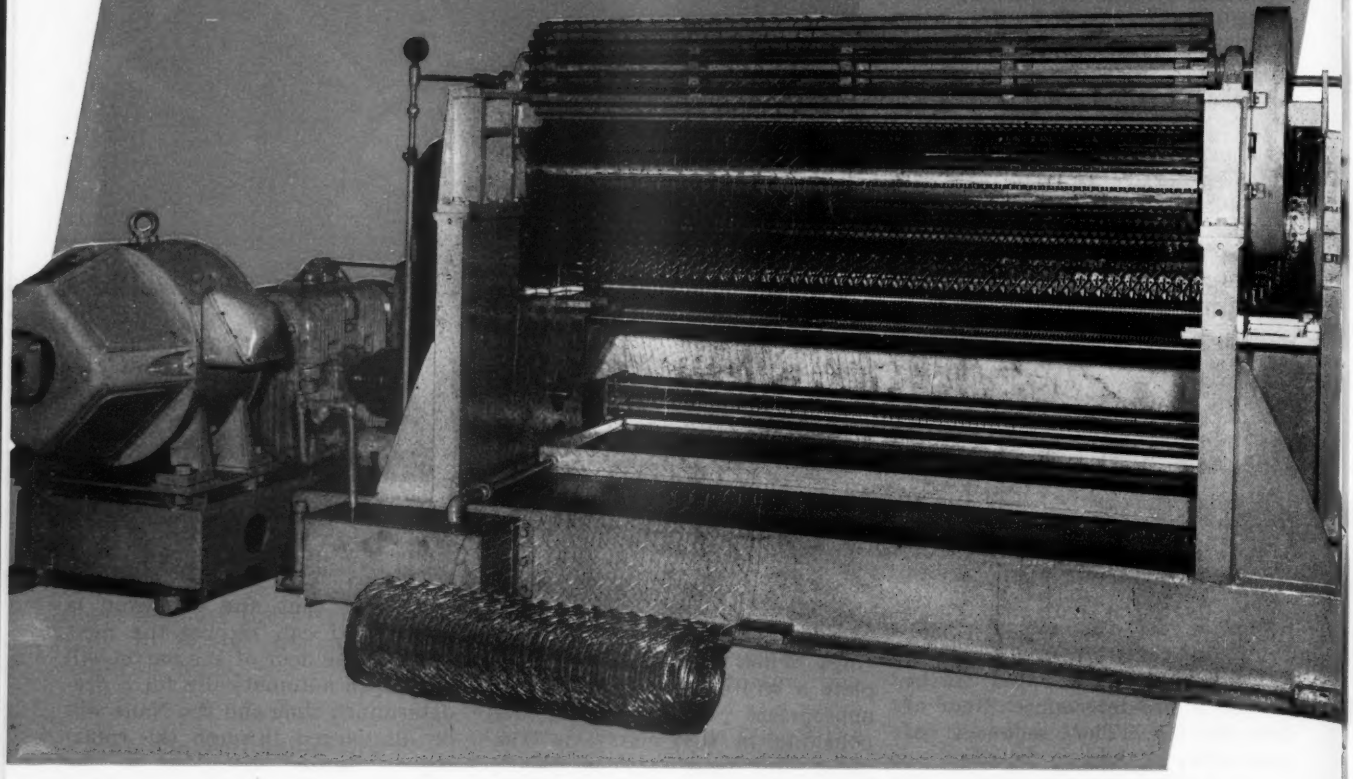
POLISHED BARREL NO.

BAGS
KEGS
CWTS | QRS | LBS
PACKER
DESTINATION | Checked
WAREHOUSE

Class	Sectn	CHARGE NO.	Cwt. QR. Lbs.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Figure 10—Record card.

NEW Wean HEXAGON NETTING MACHINE PRODUCES MORE THAN 100 FEET PER MINUTE



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Wean Equipment Corporation

CLEVELAND, OHIO

Fiberglas Yarn and Fabric Base Cable Tapes

By George H. Sherrard, Manager
Wire and Cable Sales, Textile Products Division
Owens-Corning Fiberglas Corporation
Toledo, Ohio

Nothing is static in the electric wire and cable field. New developments are coming out of the laboratories constantly. This article outlines the progress made in Fiberglas reinforced fabric base cable tapes that give new qualities of dielectric and physical protection to commercial electric cables.

WITHIN two years, development of Fiberglas-reinforced cable tapes has resulted in their successful introduction and application in an increasingly wide range of important commercial electric cables.

★ ★ ★

TWO basic types of Fiberglas-reinforced tapes are now in commercial production. They are (1) tapes reinforced with Fiberglas **yarn** and (2) tapes reinforced with Fiberglas woven **fabric.** Both tapes are intended primarily to be applied for cable insulation, generally with rubber or varnish coating; however, yarn reinforced tapes in the uncoated form are finding use as a flat, strong ribbon in binding multi-conductor cables before the jacket operation.

★ ★ ★

UNCOATED tapes reinforced with yarn are made by cementing paralleled yarns to various types of inexpensive paper or film. Spacings between yarns are determined by the breaking strength requirements of the finished tape. The illustration shows that the addition or subtraction of reinforcing yarns will provide the best economics and breaking strength for its intended cable use.

★ ★ ★

PAPER or film reinforced with Fiberglas yarn may be obtained in any desired finished coated thickness, coated with rubber, neoprene, or other suitable compounds. When slit to proper widths these tapes provide an ideal impervious tape for several cable constructions. A coated .012" tape reinforced with Fiberglas yarn usually has .007" of coating protection with only .005" of reinforcement. This can be compared to organic woven base coated tapes, which ordinarily have only a .002" coating on a .010" fabric base to achieve a .012" finished thickness. It is obvious that added protection — particularly as a moisture resistant seal — is provided by Fiberglas yarn base tape, permitting a maximum of coating and strength with a minimum quantity of reinforcement in any given total tape thickness.

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PHYSICAL advantages of cable tapes reinforced with Fiberglas yarn may be summarized as follows: They provide (1) cost reductions from 10 to 25 per cent through the combination of inexpensive paper or film and nonwoven yarns, as compared to more expensive woven organic fabrics, (2) extra coating protection, (3) excellent electrical properties, (4) low space factor where desired, (5) moisture protection, and (6) high tear and breaking strengths permitting efficient taping speeds and application.

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SEVERAL manufacturers have received Underwriters' Laboratories approval on commercial cables using these tapes, and others are planning submissions for approval. Principal applications of these coated yarn reinforced tapes are in service entrance cables.

★ ★ ★

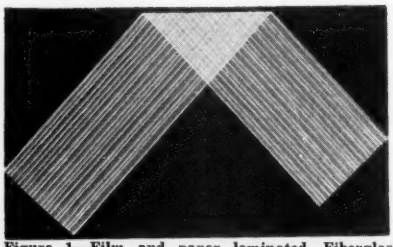


Figure 1—Film and paper laminated—Fiberglas yarn reinforced.

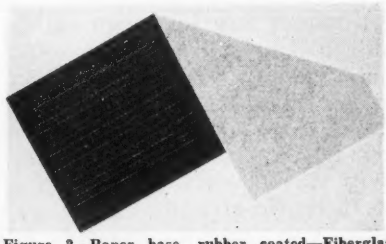


Figure 2—Paper base, rubber coated—Fiberglas yarn reinforced.

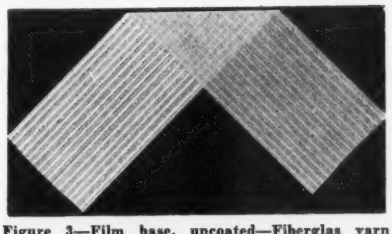


Figure 3—Film base, uncoated—Fiberglas yarn reinforced.

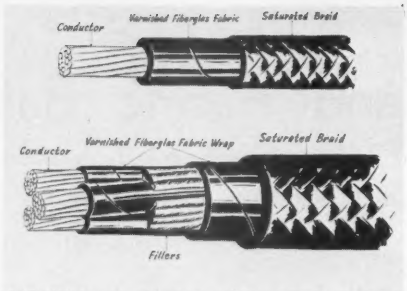
COATED cable tapes using Fiberglas woven fabrics are also advantageous in cable construction. The basic fabric is available in thicknesses ranging from .002" to .012"; however, the .002" fabric is widely used. The Fiberglas fabric has greater breaking strength than organic fabric used for similar applications so that advantage can be taken of either space savings using little compound or equal thickness to organic tapes with greater compound coating protection.

★ ★ ★

THE base Fiberglas fabric may be coated with neoprene, rubber, vinyl compounds or varnish. The fabric can be coated on one or both sides with compounds from a .006" total thickness or greater. The varnished cable tapes are usually coated to a .009" to .012" finished thickness.

★ ★ ★

AN important application for neoprene-coated Fiberglas fabric tape is as an anti-corrosion jacket for leaded cable of the type used by public utilities. The tape is first applied spirally over the lead sheath, then vulcanized. This protective covering offers many advantages: (1) the overall thickness of the covering may be considerably reduced and still obtain the greatest strength and total effectiveness of the neoprene, (2) the Fiberglas tape results in greater strength and denser covering than organic fabric, (3) it allows a substantial reduction in the lead sheath which in turn means that the cable is lighter in weight and smaller in diameter than usual, (4) the tear resistance of coated glass fabric is greater than other reinforcements of the same thickness, (5) the inorganic nature of Fiberglas also means more permanent and lasting protection, being resistant to fungus, decay and electrolysis.



VARNISHED FABRIC INSULATED CABLE

Figure 6—Power cables.

★ ★ ★

THE cost of compound coated Fiberglas fabric tape is fairly comparable to organic tapes, and where advantage is taken of the great strength-weight and thickness ratio, additional corollary savings are possible.

★ ★ ★

SEVERAL manufacturers are now preparing power cables for Underwriters' Laboratories approval using varnished Fiberglas fabric as the dielectric tape. One company has approval already. The varnished tape is strong, lightweight and closely comparable in cost to varnished organic tapes. The advantages in the use of varnished Fiberglas cable tapes are (1) excellent electrical properties 25 to 30 per cent higher than cotton, (2) low moisture content, no predrying and fast return to normal after subjection to high moisture conditions, (3) higher heat resistant for higher capacity cables, (4) high tensile strength for firm, tight wrapping without breakage, (5) high tear strength for efficient machine speeds and application, (6) economically priced, very near prices of woven organic base tapes with equal yield.

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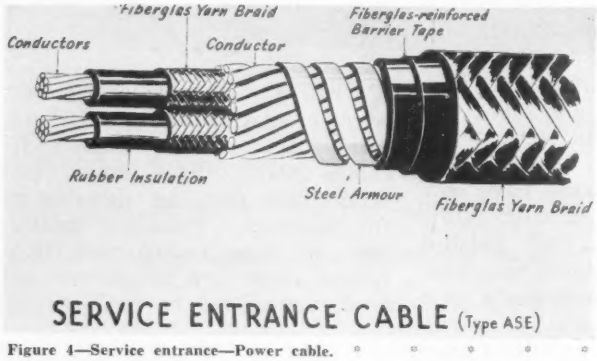
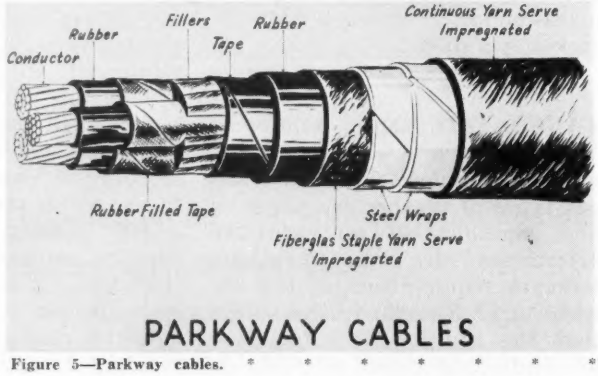


SERVICE ENTRANCE CABLE (Type ASE)

Figure 4—Service entrance—Power cable.



PARKWAY CABLES

Figure 5—Parkway cables.

American Wire Mill Equipment

A Review and Translation

By Kenneth B. Lewis
Consulting Wire Mill Engineer
Worcester, Mass.

Mr. Lewis has reviewed an article on American Wire Mill Equipment as it looks to Heinz Hoehle in an article published over his name in the January, 1950, issue of Stahl und Eisen, in which our equipment, layouts and practice are discussed at length. He visited some American mills in 1939 and again in 1949 and his observations are interesting in that they show us more clearly than we perhaps are aware, just how far we have come in a decade.

STAHL UND EISEN for January, 1950, carries a long article by Heinz Hoehle on American wire mill equipment, layout, and practice. Since he toured the mills in 1939 and again in 1949, his observations are interesting as showing us perhaps more clearly than we ourselves perceive, just how far we have come in that decade.

★ ★ ★

COMPARATIVELY little space is given to rod mills, and that chiefly to the new Sparrows Point installation, with stress on bundle weight, but the hairpin hook and its associated storage system are well covered. In the mill in general the tramrail and the ram truck systems are contrasted, and their use as complementary transport means is duly noted. The author remarks that while in rebuilt plants the crane runway girders still stand, there is rarely a travelling crane to be seen.

★ ★ ★

THE typical straight-line cleaning house is described as served by a gantry or a bridge crane, commonly with a ram truck involved in the pick-off and distribution, and at the wire machines the existence is noted of two pay-off stands of various types for flipping at each machine. Heavy bundles of finished wire are mentioned with pallets and lift truck delivery.

★ ★ ★

THE expanding stripper is noticed, and the author has apparently seen some of the rather rare outside strippers for servicing old blocks.

★ ★ ★

THE author describes our cleaning practice in some detail, noting both types of permanent tub, steel and rubber, and concrete with brick lining. He is particularly impressed with the almost universal use of open-end hooks, and contrasts it with the continental practice of piling banded rod bundles into a crate of monel or other acid-proof metal, a practice which I myself always regarded as the height of stupidity. He remarks on the complete absence of hand-thrashing for process wire. The unusually clear atmosphere and freedom from acid fumes in our cleaning houses is commended. There is an extended discussion of the lime substitutes, of which only borax and Magnus No. 267 are mentioned by name, and they are credited with doubling the life of dies.

★ ★ ★

IN the matter of wire machinery the author recognizes Vaughn and Morgan in dry and Vaughn and Syncro in the wet field. In the matter of comparison, however, either the author is vague or the present translator is slipping, for he seems to believe that the Vaughn always runs the faster, and that the non-slip feature of the Morgan is a unique advantage. The Morgan use of alternating current is commended, with expressions of horror at the cost of direct current, but it seems to me that the author strays a bit in implying that only direct current can give the creeping start which is indispensable in high speed work. He seems not to have had experience with slip-ring motors.

★ ★ ★

THE author reports briefly on a "continuous coiler" designed to strip the finished wire and lay it in a stationary coil as fast as drawn. This, it is stated, is in use with copper and aluminum, and obviates the necessity of stopping the machine for anything but inspection of dies. Syncro is mentioned in this connection, but I heard about this development several years ago, and from a European source.

★ ★ ★

MACHINES built by Union Wire Rope and by Keystone are illustrated and briefly described, as is also the Marshall Richards machine that has been under test at Roeblings, on which Dartrey Lewis reported to the Wire Association last fall. In fact the author summarizes that report in his article.

★ ★ ★

IN the matters of dies and lubricants, the author notes the declining over-all cost of the former and the steady improvement of the latter.

★ ★ ★

(Please turn to page 532)

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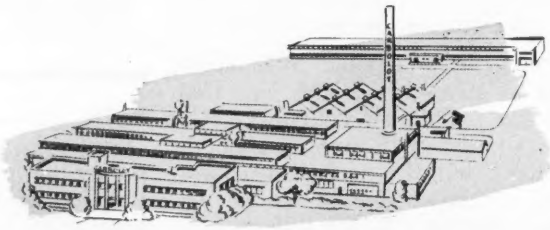

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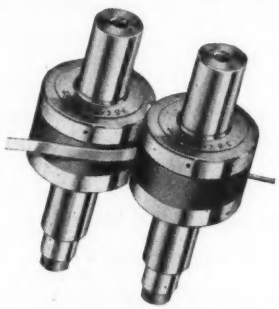
When the marking *does* wear down, the manufacturer can have the die reground and used for plain markings. More dividends with Carboloy! This performance can be yours, too, with Carboloy on the job. Find out the complete story; send in the coupon below.

Still on the spot after nine months—and asking for more!

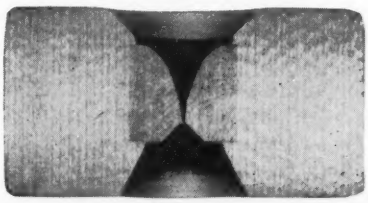


IMAGINE . . . these Carboloy flat wire rolls have been rolling nine months on one spot without any noticeable wear to date!

Setup time has been slashed 75%, spot change downtime 97%, and a better-finished, more uniform wire has been turned out since their introduction. If you're interested in similar performance in *your* flat roll operations, fill out and send in the attached coupon.

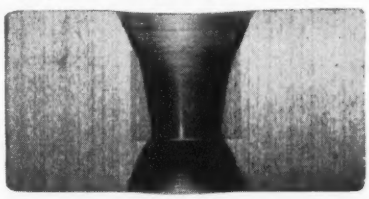
Seeing is believing in these amazing wire-draw-die records

BEFORE



This is an unretouched photograph, enlarged two times, of an R2 wire draw die, as delivered. Core of Carboloy Cemented Carbide has a starting hole size of .004", and maximum recommended hole size is .128".

AFTER



Performance record of an R2 die after use on the job is recorded in this unretouched photograph, enlarged two times. It has been refinished until its hole size is .202", almost *twice* the recommended maximum.

HOW'S that for performance? Like the same on your jobs? Get the complete story by sending in coupon for further information.

Carboloy Company, Inc.
11171 E. 8 Mile Ave.,
Detroit 32, Michigan

Gentlemen: Send us information on the following Carboloy products:

- ☐ Flat Wire Rolls
- ☐ Heading Hammer with Marking
- ☐ Wire Dies

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

Wire and Tube Drawing Dies

Thin Metal Parts Successfully Heated by Induction

By

Dr. Joseph F. Libsch

Asst. Prof. of Metallurgy, Lehigh University and Metallurgical Consultant, Lepel High Frequency Labs., Inc., New York, N. Y.

and

Anthony Vescuso

Chief Laboratory Engineer Lepel High Frequency Labs., Inc., New York, N. Y.

The advantages of induction heating for small wires and metal parts lie primarily in its ability to do this without distortions of the work. While this is only one of many applications for this principle of heat-treatment, it is a use in which many product fabricators will find a solution to some delicate problems.

Introduction

HIGH frequency induction heating has been successfully applied for the heat treatment of a multitude of metal parts used by industry. Although careful coil design has overcome many difficult problems concerning selective heat patterns, odd shapes, and unique specifications, heat treating small thin parts has generally resulted in failure.

★ ★ ★

IF such items as needles, thin strip, and fine wire are held in an alternating magnetic field of

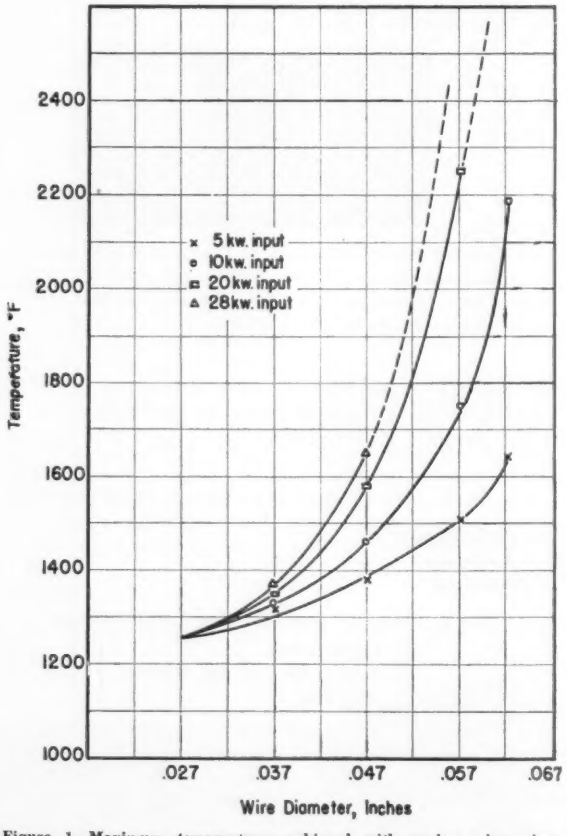


Figure 1—Maximum temperatures achieved with various size wires after extended heating. Wire heated in ½" diameter coil using the power inputs indicated. * * * * * * *

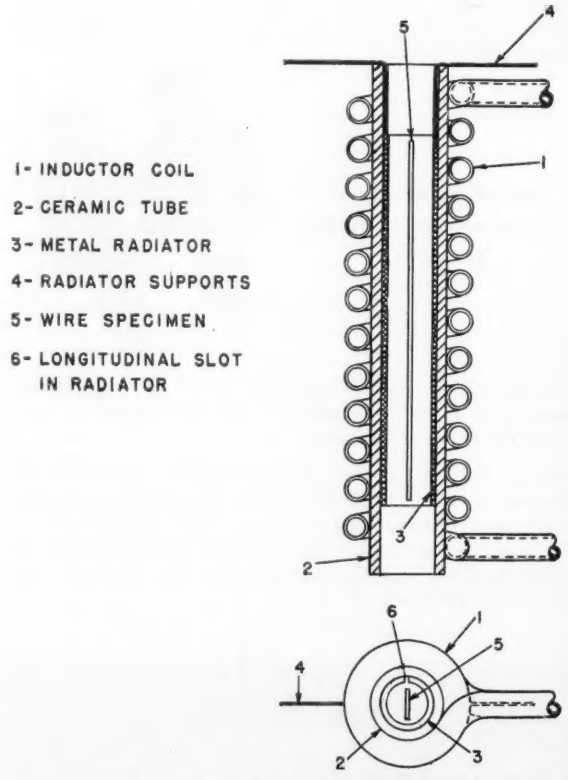


Figure 4—Typical coil design for heating fine wire. * * *

500,000 cycles per second or less, they will heat to some maximum temperature rapidly, but will not exceed this temperature even after extended periods of time. This behavior is illustrated by Fig. 1 which shows the maximum temperatures achieved by different size wires heated for extended periods of time. For wires with small diameters, i.e., .027″ and .037″, increased power is not effective in increasing the temperature of heating appreciably. With larger diameter wires, both increased power and closer coupling between the heating coil and the work cause a rapid increase in temperature.

★ ★ ★

THE maximum temperature achieved in heating represents an equilibrium between the ability of the wire to absorb induced energy and the radiation, conduction and convection losses from its surface. In steel the maximum temperature generally corresponds with an abrupt decrease in permeability at the transformation or Curie temperature, i.e., at a temperature below that required to austenitize the steel for successful heat treatment. Thus, while heating to the maximum temperature is almost instantaneous, heat treatment is normally unsuccessful.

★ ★ ★

BROWN, Hoyler and Bierwirth[1] have considered the problem of induction heating parts of small diameter theoretically, and have shown that megacycle frequencies may be used to heat these thin parts. Figs. 2 and 3 show the critical frequency required for efficiently coupling wires of various diameters and the decrease in efficiency associated with frequencies below the critical value. Unfortunately, this method of treating parts relies on frequency control, and requires a wide variation in frequency to accommodate a small change in diameter.

★ ★ ★

A TECHNIQUE for heating such small parts successfully using a standard commercial converter operating at 500 kilocycles or less, and providing flexibility for heat treatment of both small and large sections appears desirable. Such a method with illustrations is described in this article.

★ ★ ★

History of Development

SINCE the temperature attained by a metal piece within an inductor coil carrying radio frequency current depends upon the heat lost by conduction, convection and radiation to the surroundings, as well as upon the power absorbed by the piece, it appeared that an attempt to decrease the conduction and radiation losses by interposing a heat barrier or radiator between the coil and the piece being heated might be helpful. Accordingly non-metallic heat barriers in the form of ceramic tubes and asbestos insulating cylinders were placed between the heating coil and the piece to be heated. These barriers were not particularly effective, but suggested the use of a metal barrier, heated by the alternating magnetic field, and designed to avoid shielding the magnetic flux from the work piece.

★ ★ ★

THIS design was accomplished by providing metal sheet bent to form a cylinder with a longitudinal slot 1/16″ to ⅛″ wide along its entire length. When this metal cylinder was located between

(*Please turn to page 519*)

[1] **Figures 2 and 3 are shown through the courtesy of D. Van Nostrand Co., Inc., from their book "Radio Frequency Heating" (1947) by Brown, Hoyler and Bierwirth.**

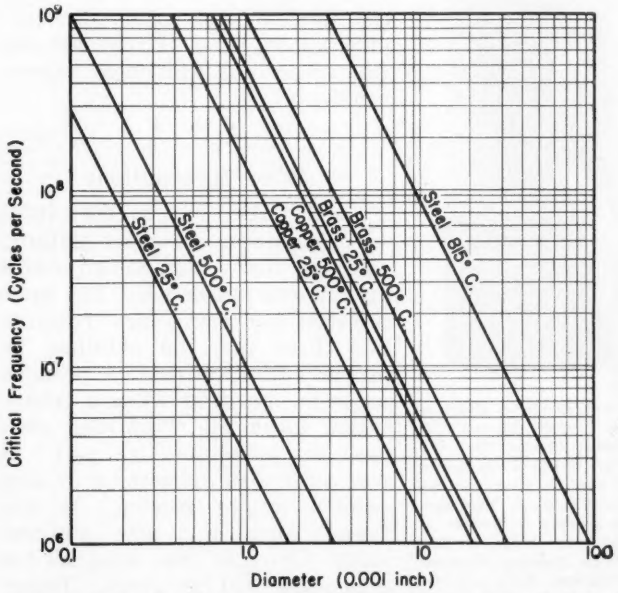


Figure 2—Critical frequency as a function of wire size. Brown, Hoyler and Bierwirth.

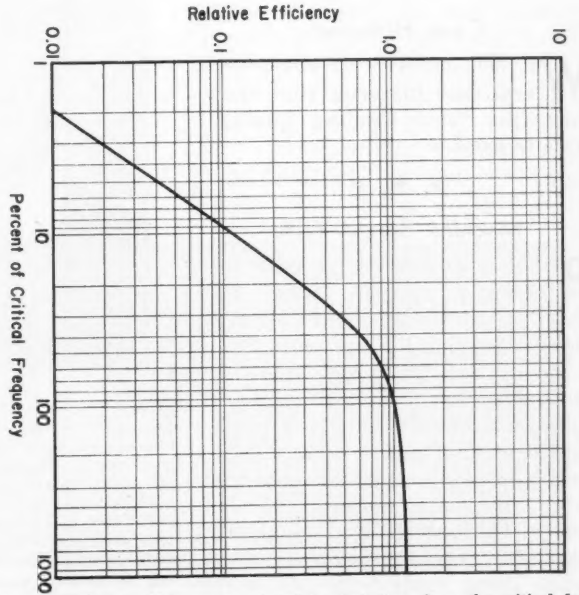


Figure 3—Relative efficiency as affected by deviations from the critical frequency. Brown, Hoyler and Bierwirth.

The Business of Cold Heading

By Kenneth J. Sorace, Project Engineer
Lamson & Sessions Co.
Cleveland, Ohio

This interesting article on cold heading and the factors that enter into the making of fasteners will be found to contain many useful suggestions for both wire men and the cold heading fraternity.

BEYOND the Portals of the Pickle House and thru the doors of the Wire Drawing Mill, processed wire receives the real test of Quality.

★ ★ ★

A PLANT such as the Lamson and Sessions Company of Cleveland, Ohio uses wire produced by many steel companies. They also process purchased "rod." The ideal situation would be that wire, no matter where produced, could be used for all types of cold heading work. This, however, is not the case. A variety of steel analyses, tensile and hardness specifications, and wire finishes are used. The requirements of various operations have made it necessary to have available annealing furnaces, special wire drawing dies, and drawing compounds. In addition, specific sequences of operations must be followed.

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Case Histories

WE will endeavor to cover several case histories that show how this "cold heading quality" wire is used.

★ ★ ★

Machine Screw Wire

BOLT users today have generally accepted recessed head machine screws for many applications. We make Phillips and Clutch head as well as struck and saw slotted screws. Since their basic difference is in the driving mechanism of the head, one would expect that they could be produced from the same material. C-1010 and C-1018 steels are frequently used for this operation, a 10-24 screw being made from .156 wire. Normal practice for the saw slotted type is to draw this material from 7/32" rod in one pass. See Fig. 1.

★ ★ ★

THE wire so produced has a hardness of 90 Rockwell B and a tensile of approximately 90,000 p.s.i. The finish is a stearate and lime combination that protects the heading die from scoring or picking up metal from the friction of sliding in or of kicking out. When this wire was tried on "struck" slot work, the slotting hammers showed a rather poor life. A "softer" wire drawn from annealed .186 wire increased hammer life and this second wire was then used for Phillips and Clutch head machine screws. It was found that these hammers were breaking too often to be profitable. Tests and experiments showed that wire of minimum hardness and tensile strength was needed, preferably 65,000 p.s.i. or less. See Figs. 2 and 3.

Kenneth J. Sorace, Project Engineer, Graduate Electrical Engineer from Cornell University at Ithaca, New York. Combat Fighter Pilot and later Project Engineer at Wright Field during the war. Metallurgical work at Case Institute of Technology and Fenn College in Cleveland. Came with Lamson and Sessions in October of 1945 doing Project Work. In charge of Raw Material Preparation, Wire Drawing Practices and the development of Carbide Tools and Dies for wire drawing and cold heading. Registered Professional Engineer in State of Ohio. * * *

★ ★ ★

ALTHOUGH a strict definition of the statement that the original wire for saw slotted work was "cold heading quality" we see that it is not possible to use it for all types of machine screws.

★ ★ ★

Annealing Increases Cost

THE annealing process necessary to produce the softer wire makes the cost of this material greater and requires a specification to be written so that the supplier knows what is required and the user can produce screws profitably.

★ ★ ★

Wire Substitutions

SOMETIMES, due to difficulties in obtaining the exact material specified for a bolt, substitutions are allowed by the user. The same physical properties are required but these may be obtained by proper heat treatment. A problem arose in our plant when a substitution was made in an alloy steel used for an automotive part. It was a pin .615 diameter x 2" long pointed in the header. It was found when the new material called Alloy "B" was used, all the pins were .040 too short. Immediately the toolroom was ques-

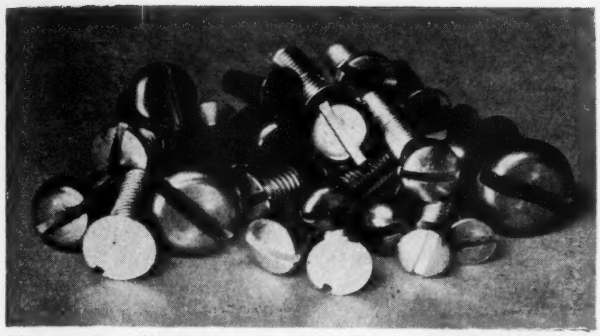

Figure 1—Saw slotted screws.

Figure 2—Struck slot screws.

tioned, the dies checked and found to be made exactly to the sketch. We had been making the part for some time and tools were taken from the die crib as needed. As a matter of fact, the same tools used the day before on Alloy "A" were being used on Alloy "B!" There was only one answer which was soon verified. Alloy "B" had a springback of .040 of an inch more than Alloy "A." Could it be predicted? Maybe, sometimes we have to learn the hard way.

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Special Parts Require Special Handling

MAKING of parts for the automotive trade has changed many concepts of cold heading wire due to the many operations required to produce a part. Take for instance a Special Offset head adjusting screw. Operations in this case include: Heading, extruding, trimming, heat treatment, flattening and rolling, plus inspection and packing. See Fig 4.

★ ★ ★

THEY all sound simple enough but broken down we find out something about their complications. The heading is done in a solid die. To stay within proper stock limits for heading, a .366 wire is used, extruded on the shank to .345 for the 3/8-24 thread to be rolled later. The offset shoulder and head are upset and "flashed" to fill the shoulder with a "square" bottom. The head is trimmed.

★ ★ ★

A FURTHER extrusion of the shank is necessary so that the tip may be flattened. That is accomplished, and after a stress relieving heat treatment, blank rolling and thread rolling, the product is inspected, packed and shipped. See Fig. 5.

★ ★ ★

STARTING with the heading operation, the requirements for the wire would be as follows: A dry coating so that it will not pack in the die and prevent filling of the shoulder. It must also be an extruding finish. When we look further into the operations we find it must be a finish suitable for double extrusion. The second extrusion taking place in a punch press. The wire must be soft enough to upset the head and fill the shoulder, but stiff enough to extrude without bending or upsetting. A relatively seam-free material is required to prevent split heads. The material after heading should be brittle enough around the head to trim cleanly but not so brittle that the head pops off.

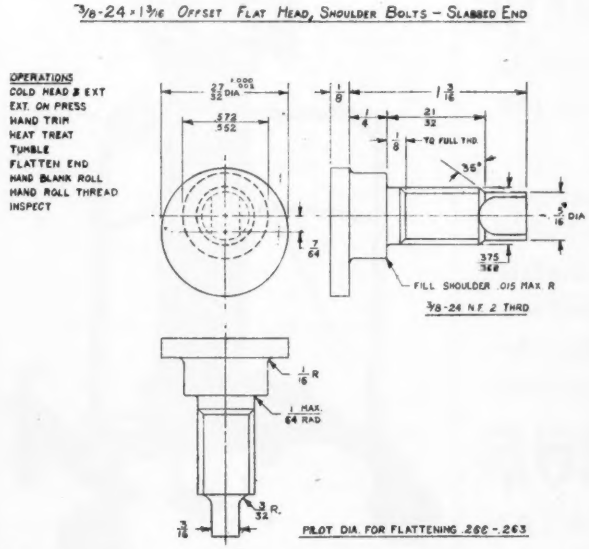

Figure 4.

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Cost Is Big Factor

LIMITATIONS in cost of this part may be a great factor

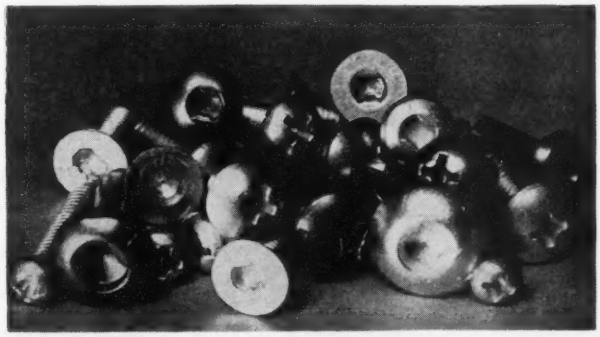

Figure 3—Phillips and clutch head screws.

(*Please turn to page 517*)

Wire Association - Annual Directors Meeting - April 21, 1950.

AT the Annual Meeting of the Board of Directors of the **Wire Association** held in New York on April 21st, **Fred M. Crapo**, President of the Indiana Steel and Wire Company was elected President, **John A. Moritz,** Superintendent of Wire Mills, Keystone Steel and Wire Company, was made Vice President, Ferrous Division, **Ralph B. Roth,** Vice President of the Ludlow-Saylor Wire Company, was named Vice President, Non-Ferrous Division, and **Richard E. Brown,** Executive Secretary of the Wire Association was re-elected to the same post. All officers are for one year.

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AT the same time the following new directors were seated: **J. R. Thompson,** Manager, Metallurgical Department, American Steel and Wire Company, **Paul A. Nehring,** President, the Nehring Electrical Works, and **Karl H. Baessler,** Works Manager, The California Wire Cloth Corp., who was unable to be present.

FREDERICK M. CRAPO

President, Indiana Steel and Wire Co., Muncie, Indiana. Inventor of Crapo Galvanizing Process. Responsible for development of steel conductors that bear his name. Graduated in 1919 from Race Polytechnic Institute with B.S. degree. Took post-graduate course at M.I.T. Joined his present company in 1923 as chief engineer. In 1927 became Vice President, charge of Operations. Succeeded to the presidency upon the death of the company's founder, Alva L. Kitselman, in 1940. Member of the Wire Association, A.I.E.E., A.S.T.M., A.S.M., American Welding Society and American Standards Association.

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THE minutes of the previous meeting held in Chicago in October, 1949, the Treasurer's report and the Secretary's report were read and approved, together with a motion to approve the acts of officers and directors during the preceding six months. In these reports it was mentioned that our memberships as of March 31, 1950, stood at 725 and that there was a balance in the Wire Association's treasury of $529.23.

★ ★ ★

THE method of financing the regional meetings was brought up for discussion and the treasurer of the Wire Association was authorized to advance the sum of $175.00 to the Regional Meeting

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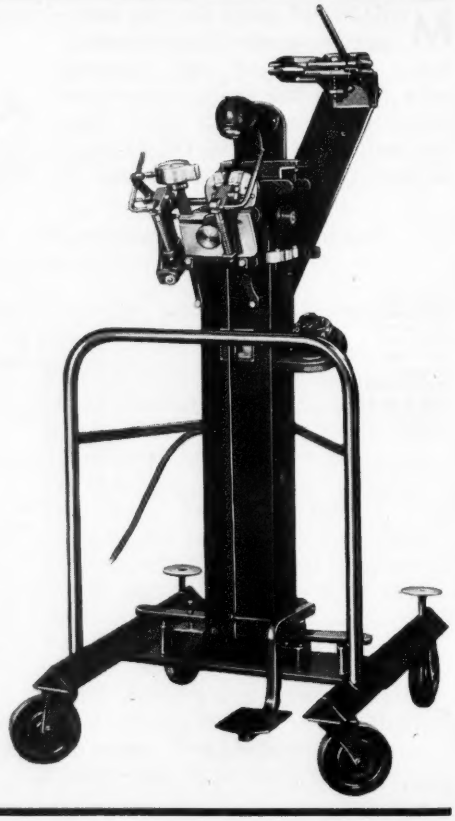

MICRO PRODUCTS CO.,

20 NO. WACKER DR., CHICAGO 6, ILL.

Telephone: STATE 2-7468

Chairman prior to a meeting, any amount remaining over after the meeting to be returned to the treasurer. This arrangement replaces the previous one of having the treasurer make up any deficit **after** the meeting. Should there be a deficit over and above the money advanced, the meeting chairman will hereafter make a report to the Board of Directors and request instructions as to the method of meeting it.

★ ★ ★

MR. BROWN announced that **N. W. deBerardinis** of the Firth-Sterling Steel and Carbide Corporation had been invited to serve as Chairman of the Smoker-Dinner Committee for the 1950 annual convention and that a written acceptance had been received. A motion to approve the appointment was made and seconded. A further resolution was passed expressing the appreciation of the Board for the splendid job done in this capacity by **Eber J. Hubbard, Jr.** of the Hubbard Spool Company for the 1949 convention.

RALPH B. ROTH

Mr. Roth was born August 31, 1888. He started with the Ludlow-Saylor Wire Company on June 16, 1914. In 1924 he was appointed to the post of Purchasing Agent and on May 15, 1930 elected a Director of the Company. In 1943 to this responsibility was added the office of Vice President. On January 16th, Mr. Roth was re-elected a Director and made Vice President and also appointed Secretary and Director of Purchases. He has been an active member of the Wire Association for many years, of which he is a Director, and at the Spring Meeting of its Board, was elected Vice President, Non-Ferrous Division. He is also a member of the St. Louis Chapter of the National Association of Purchasing Agents, and the Shrine and a life member of the B.P.O.E.

★ ★ ★

AFTER a great deal of consideration the Nominating Com-

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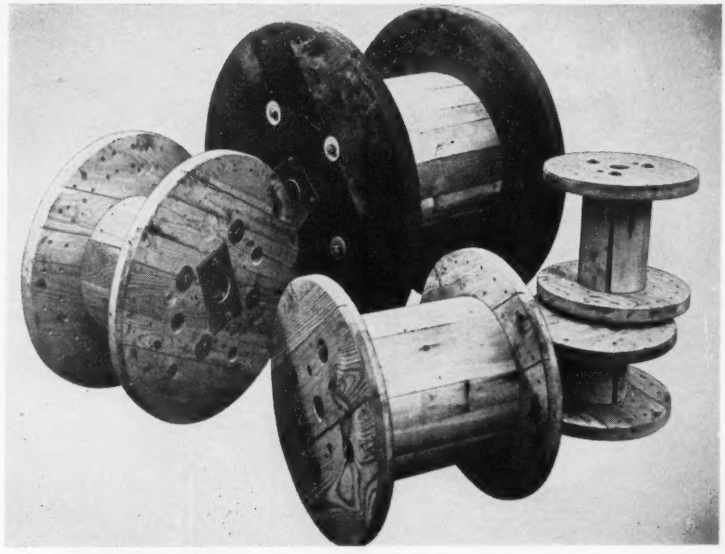

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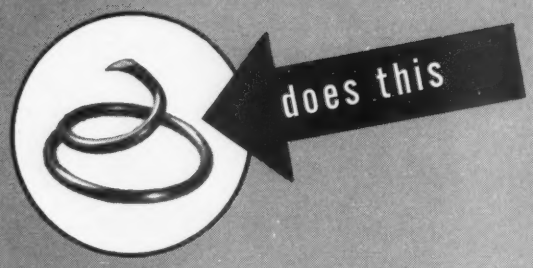

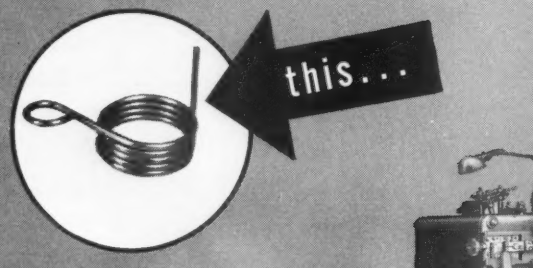

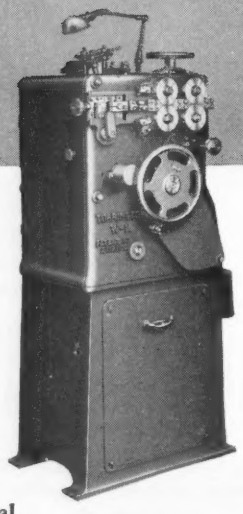

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Torsion and other attachments available.

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mittee recommended the following persons to serve as members of the Executive Committee: **Fred M. Crapo, Ralph B. Roth, Sidney Rolle, Ralph K. Clifford** and **D. D. Buchanan**; they were elected by unanimous vote.

★ ★ ★

AT the Board meeting in October consideration was given to the possible need for a revision of the Association's By-Laws to adapt them to present conditions. A committee consisting of Messrs. **Rolle, Seymour, Crapo** and **Brown** was appointed.

JOHN A. MORITZ

John A. Moritz joined the Keystone Steel & Wire Company in 1922 at the age of 22, working in the Galvanizing Department. Later he became foreman of the Fence and Barbed Wire Departments. Shortly after Keystone purchased controlling interest in the Mid-States Steel and Wire Company, he was made, in 1928, superintendent in charge of Operations, which post he holds today, in addition to being Superintendent of Wire Mills at Keystone, to which he returned in 1936. Mr. Moritz is considered a leader in the wire industry. He is a charter member of the Wire Association and a director since 1941.

The committee's suggestions were discussed and certain revisions approved that require a two-thirds vote of the membership for adoption. The By-Laws, with the changes proposed, have been mailed to all members. Secretary Brown urgently requests all members to mail in their ballots without delay, if they have not already done so.

★ ★ ★

REPORTS on future meetings of the Wire Association were submitted, resulting in the approval of the following locations for the Annual Conventions: 1950, Baltimore; 1951, Chicago; and 1952, Cleveland. Hotel arrange-

ments have now been concluded as follows, respectively: Lord Baltimore Hotel; LaSalle Hotel; and Carter Hotel. The question of holding a meeting at a time that would not conflict with other association gatherings resulted in a decision, starting in 1952 in Cleveland, to move the convention date to the second week in November.

★ ★ ★

THE holding of regional meetings in Peoria and in San Francisco this year in May and June, respectively, were approved. The Peoria meeting will have been held by the time this report is published. The San Francisco meeting is scheduled for June 16th.

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THE reports of the various program chairmen for the 1950 convention were read and discussed, the arrangements for technical papers having been entirely completed, together with two plant inspection trips.

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The Medal Award for 1949

THE Directors considered various papers that had been published in WIRE AND WIRE PRODUCTS in 1949, written by Association members, resulting in the Medal Award being voted to **John H. Corson, John A. Roebling's Sons Company,** for his paper: **"Welding in the Wire Industry;"** a certificate of honorable mention was awarded to Messrs. **Lewis** and **Godfrey** for their paper: **"Back Pull Wire Drawing,"** both also Roebling men; and a similar certificate to Messrs. **deCoriolis** and **Cullen** of **Surface Combustion Corporation** for their joint paper: **"Protective Atmospheres for Annealing Non-Ferrous Wire."**

★ ★ ★

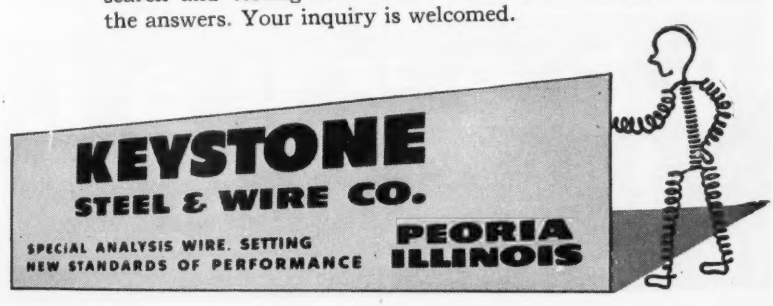
FOLLOWING the meeting, the directors and members of the Wire Association met for luncheon. Forty were present. Mr. Crapo addressed the group as the newly-elected president, paying warm tribute to **Jack Seymour** for the high standards of leadership and devoted service set by him in the last two years as our president.

★ ★ ★

Production reports prove that Keystone's new "special processed" cold heading wire effects considerable savings in the manufacture of Phillips head, clutch head and cross recessed head screws.

The excellent flow properties of this new wire deliver the desired upsetting and die forming qualities with a high degree of uniformity. Die and plug life are often more than doubled . . . finished product rejections are minimized . . . the cost of expensive final inspection is reduced. The superior plating qualities of "special processed" wire further assure a better finished product.

Regardless of the performance demanded in your wire products, consult Keystone for the materials to meet your most exacting specifications. If special treatment is required, Keystone's metallurgical research and testing facilities are available to supply the answers. Your inquiry is welcomed.



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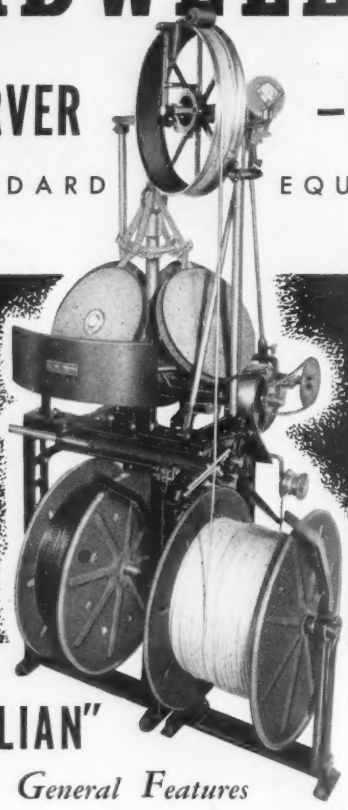

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Paper passes through a die located at serving point, thereby producing a product with a firm, smooth finish and of uniform diameter over its entire length.

"WARDWELLIAN" Paper Server *General Features*

- Machine is equipped with electric stop-motion.
- Production dependent upon requirements. Will produce 1407 feet per hour when machine is applying material at 10.6 turns per foot.
- Standard set of twelve change gears furnished with each machine.
- Serving head speed 250 RPM.
- Driving pulley 8″ diameter; 1¾″ belt. Speed 575 RPM.
- Ratio pulley speed to serving head speed 2.3 to 1.
- Capstan 18″ diameter, 3″ face.
- Opening through serving head ⅝″ diameter.
- Supply packages 14″ diameter, 1½″ hole; paper up to 1½″ wide, .003″ thick.
- Maximum power requirements .6 HP including power transmission equipment.
- Motor drive can be furnished upon request.
- Stands can be furnished to accommodate reel 30 inches in diameter with overall widths up to 16 inches.
- Special windup driving parts required for reels with drums under 8″diameter.
- Reels are not included with machine.
- Weight approximately 508 lbs.
- Weight crated for domestic shipment approximately 615 lbs.

There are nearly thirty different applications for Wardwell equipment, including Braiding, Shielding with wire, Tape Serving, Yarn Serving, Asbestos Serving, Paper Serving, Armor Serving and Resistance Wire Serving.

WARDWELL BRAIDING MACHINE CO.

Central Falls Rhode Island, U. S. A.

Representatives for Europe, British Colonies and Dependencies

JAMES MACKIE & SONS, LTD., BELFAST, IRELAND

F. R. MORRAL, Associate Professor of Materials Engineering, Syracuse University, following the luncheon, addressed the assemblage on conditions as he found them in a Spanish wire mill and a steel plant, both of which he visited in January. Motion pictures taken by him illustrated his talk. The description was both enlightening and entertaining, leaving his American listeners with the feeling that they have much at stake to safeguard in this country in the way of liberty, security and prosperity.

★ ★ ★

Government Report on Impregnating Varnishes

SUPERIOR electrical impregnating varnishes to withstand conditions of extreme temperature and humidity are discussed in a brief review of this field released recently by the Office of Technical Services of the U. S. Department of Commerce.

★ ★ ★

THE varnishes, developed in research for the Signal Corps, are described in a detailed report which has now been made publicly available.

★ ★ ★

THE article on impregnating varnishes appear in the current issue of the "Technical Reports Newsletter" issued monthly by O.T.S. The Newsletter also contains items on surplus electronic equipment; alignment of machine tools; blast driving of anchorages; water softeners; cargo vessels and cargo flooring; nylon lacquer; textile research; German iron and steel developments; and other technical reports.

★ ★ ★

SINGLE copies of the Newsletter are available on request from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., or from U. S. Department of Commerce field offices.

★ ★ ★

New Bulletin on Emery Crane Scales

BULLETIN No. 501 is a new catalog issued by **The A. H. Emery Co.**, Stamford, Conn., specialists in hydraulic and pneumatic weighing systems. The bulletin, replacing data sheets previously issued, brings up-to-date and consolidates information on the use, advantages, and construction of Emery Hydraulic Crane Scales for measuring loads while in transit. Complete information is included, including a section on the Emery remote load indicating or printing system which allows weights to be read and recorded at distances of up to 1000 feet from the scale itself. A copy of the Bulletin 501 will be sent free of charge.

* * *

Bulletin on Metal Protection and Paint Bonding

THE AMERICAN CHEMICAL PAINT COMPANY, Ambler, Pa., has published Technical Service Data Sheet No. P-100-21 March, 1950, giving a quick reference list and descriptions of their metal protective and paint binding chemicals and processes.

* * *

THIS data sheet, which contains much practical information, will be mailed to any of our readers who request it.

* * *

To . . . .

WIRE MILL MEN

Have you considered joining the Wire Association? You are cordially invited to become a member. Dues are $15.00 a year, which includes a subscription to WIRE & WIRE PRODUCTS and a copy of the Annual Buyers Guide.

THE WIRE ASSOCIATION
300 Main Street,
Stamford, Conn.

Good News —

NOW, all Johnson XLO Music Spring Wire is made from imported, improved Swedish rod. Johnson researchers plus the resources of Swedish steelmakers have developed an electric furnace steel, with closely controlled analysis, which is being used exclusively in Johnson Music Spring Wire. The result—more uniformity and added fatigue.

This quality advance is in line with the Johnson policy of giving something better whenever possible.

Ample stockpiles warrant a continuous supply.

JOHNSON
STEEL AND WIRE COMPANY, INC.
WORCESTER 1, MASS.
New York Philadelphia Cleveland Detroit Akron Chicago
Atlanta Houston Tulsa Los Angeles Toronto

Outstanding Personalities of the Wire Industry

The Tainton Company Reorganized

THE TAINTON COMPANY has been newly organized to acquire and continue development of certain of the assets of the former Tainton Products Company, Division of Freeport Sulphur Company, which, since 1947, has operated the research organization founded by the late U. C. Tainton.

* * *

THE new company will continue operation of the original laboratory at 3100 Elm Avenue, Baltimore, Maryland. Direction will be in the hands of **Erith T. Clayton** and **Rolfe Pottberg,** who have been associated with the organization since its formation in 1931.

* * *

PROCESSES which this laboratory has developed or had a part in developing include the "Bethanizing" process for electrogalvanizing; the "Pneubin" method for material handling; various processes for the descaling of steels some of which have been promoted by the Hooker Electrochemical Company; and many other processes.

* * *

AMONG its new developments is a method for plating small hardware in large batches, by which it is said substantial plates of zinc, cadmium, tin and certain other metals can be applied without the use of heat or electricity at considerable savings. Other processes being prepared for introduction are said to include a method of applying continuous, alloyed films of zinc and other metals to fixed structures and a new means for the deposition of aluminum.

* * *

J. A. Herring Joins Naugatuck Chemical Staff

APPOINTMENT of **J. A. Herring** as technical sales representative for Marvinol vinyl resins in the New York area was announced recently by **Harold M. Parsekian,** manager of vinyl sales, Naugatuck Chemical division, **United States Rubber Company.**

* * *

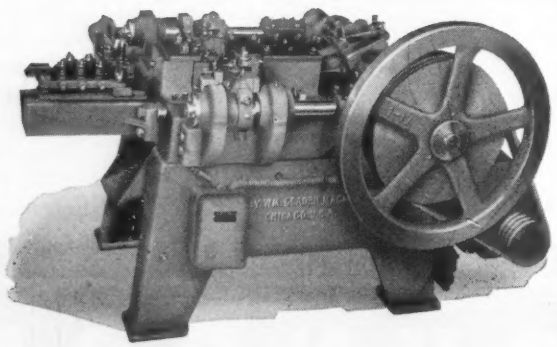
MR. HERRING will make his headquarters at the Naugatuck Chemical's New York office, 254 Fourth Ave.

* * *

FOR the past nine years, Mr. Herring has worked closely on the development, production and sale of Naugatuck Chemical's new plastic materials such as Vibrin polyester resins, Kralastic molding powders, PQL resin enamels and Kotol strippable coatings.

* * *

GLADER HIGH SPEED WIRE NAIL MACHINE



MACHINE ARRANGED FOR INDIVIDUAL MOTOR DRIVE

High tonnage output, and low maintenance costs, have resulted in Glader Machines being accepted as standard equipment in every large nail mill built in the United States in the past twenty years.

Glader Machines are operating in most of the wire producing mills throughout the world.

These machines are made in eleven different types and sizes. This enables us to cover the range of sizes of nails produced with the greatest efficiency.

For further information please address,

WM. GLADER MACHINE WORKS
210 No. Racine Ave.
Chicago 7, Illinois

Export Dept.: 122 E. 42nd Street, New York 17, N. Y.

Riverside Metal Appointments

THE RIVERSIDE METAL CO. of Riverside, N. J., has appointed the **Clifford Metal Sales Co.**, of Providence as a warehousing distributor in the Rhode Island area. The appointment marks another step in the current program of extending the company's warehousing facilities and expediting delivery to customers.

* * *

THE company has also made **George W. Spanberg**, 549 W. Washington Blvd., Chicago, manager of that office, with **James T. Duffy III** as assistant. Mr. Spanberg succeeds the late Charles Summer.

* * *

Owens-Corning Fiberglas Appointments

THE promotion of **Fred F. Sampson, Jr.**, to the position of manager of Electrical Sales, Textile Products Division of **Owens-Corning Fiberglas Corporation**, has been announced by **J. H. Thomas**, company vice-president and general manager of the Textile Products Division.

* * *

AT the same time Mr. Thomas announced the appointment of **Richard J. Lasko** as manager of the newly created Apparatus Insulation Sales Section. **George H. Sherrard** will continue as manager of Wire and Cable sales. Mr. Lasko and Mr. Sherrard will report to Mr. Sampson.

* * *

MR. THOMAS said the expansion of the Electrical Sales organization is in answer to increased uses for electrical insulation materials containing Fiberglas yarns in both the apparatus, and wire and cable fields. He attributed this growth to increasing recognition on the part of users, of the advantages deriving to them of the physical properties of inorganic Fiberglas yarns.

* * *

American Steel & Wire Co. Appointments

CHARLES M. KAY has recently been appointed division superintendent of steelworks of **American Steel & Wire Co.'s** south works in Worcester, Mass. He started with the company in 1936 and has most recently been assistant division superintendent of the Worcester steelworks.

* * *

Republic Steel Co. Appointment

E. J. MAGEE was appointed director of industrial relations, **Republic Steel Corp.**, Cleveland. He succeeds **J. A. Voss**, who submitted his resignation following an extended period of illness. Mr. Magee has been acting director for the last several months. **R. H. Ferguson** was appointed assistant director of industrial relations, and is succeeded by **W. M. Nelson** as manager of Republic's safety program.

* * *

The SPECIALISTS in
Wire - Straightening and Wire - Cutting!

Diameter Range — 1/16" to .005"

PRECISION - Our Motto

DON'T hesitate to call on us when you are confronted with wire-straightening problems involving close tolerances and absolute accuracy. For seventeen years we have specialized in straightening and cutting all gauges of fine wire, hard or soft, ranging in diameter from one-sixteenth of an inch down to five-thousandths of an inch. We employ gun-barrel accuracy in straightening lengths from one inch to ten feet or any fractional part thereof. Ends cut absolutely clean without burrs.

ASK ABOUT OUR UNEXCELLED FACILITIES FOR CLEANING AND POINTING WIRE ALREADY STRAIGHTENED AND CUT.

ALL TYPES OF WIRE...

- Nickel
- Stainless Steel
- Bronze
- Brass
- Copper
- Alloy Wire
- Music Wire
- Tag Wire
- Florist Wire

Write us today!

Manufacturers of the famous ARMA PAPER CLIP

PITTSBURGH CUT WIRE COMPANY
1112-20 GALVESTON AVENUE · PITTSBURGH, PENNSYLVANIA.
TELEPHONE: CEdar 4702

Durant Appointments

THE DURANT MANUFACTURING COMPANY, Milwaukee, Wisconsin, announces the appointment of **Ellsworth W. Crane** as Mid-West Regional Sales Manager for Durant Productimeter Counting and Measuring Machines.

* * *

MR. CRANE has been field representative for the Wisconsin and northern Illinois territory for the past four years. For twelve years before that he served in several capacities at Durant, building up a wealth of experience in counter design, performance and application. Under his management will be the sales territories of Milwaukee, Chicago, Cincinnati, Cleveland, Detroit, Indianapolis, and Pittsburgh.

* * *

AT the same time the appointment of **John C. Turner** of Atlanta, Georgia, as representative for Productimeter Counting and Measuring Machines in general industrial and textile fields in Georgia, was announced.

* * *

Brooke Named Vice President of Morrison

BARTON E. BROOKE has been named Vice President and Treasurer of Morrison Engineering Corporation, Cleveland, Ohio, according to **Leonard A. Davis,** President of Morrison.

* * *

MR. BROOKE was formerly associated with the Lombard Corporation of Youngstown, Ohio, and has been active in the industrial heating field for several years.

* * *

THE Morrison Engineering Corporation of Cleveland designs and produces several different types of industrial furnaces and convection-type heating equipment.

* * *

U. S. Rubber Appointments

APPOINTMENT of **C. H. Madsen** as assistant to the operations manager, synthetic rubber division, **United States Rubber Company,** was announced recently by J. C. H. Wendes, operations manager.

* * *

AT the same time, **T. A. McCoy** was named factory manager of the synthetic rubber plant operated by U. S. Rubber at Borger, Tex., succeeding Mr. Madsen.

* * *

Durso Heads Eastern Sales for Fiske Brothers

L. A. **RYAN,** Vice President of **Fiske Brothers Refining Co.,** Newark, New Jersey, announces that **Anthony J. Durso,** formerly Assistant to James E. Sheehan, who has since passed away, has been made head of the Eastern Domestic Sales Division with the title of Eastern Sales Manager.

* * *

Hydraulically Operated **TRAVERSE REELS**

FOR FLAT WIRE AND NARROW STRIP

• The self-contained, compact SECO Traverse Reel has smooth, powerful hydraulic operation — at speeds from 150 to 600 feet per minute.

PERFECT SPEED CONTROL from zero to top running speed through flow control.

ACCURATE TENSION CONTROL through pressure regulation.

Built in sizes for coils weighing up to 600 lbs., for round or flat wire. Unit shown occupies floor space 24" x 42". Modifications in design and construction to meet specific requirements.

WIRE SPOOLERS

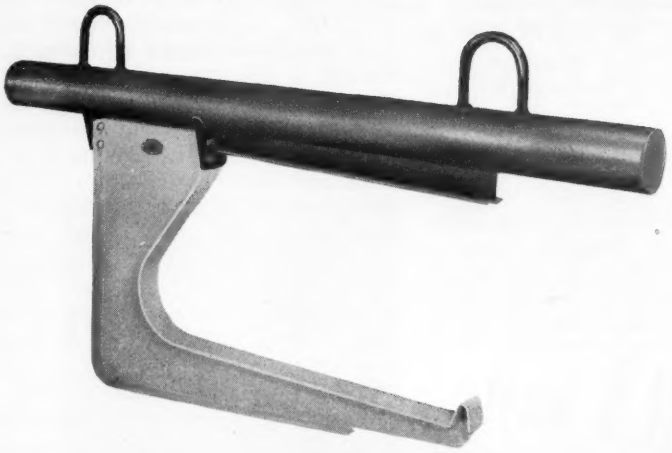
Single and Multiple Type

Speeds Up To 4,000 feet per minute

STEEL EQUIPMENT CO.

SECO 2890 EAST 83rd STREET
CLEVELAND 4, OHIO

DESIGN FOR 1960 !



An acid resisting hairpin hook utilizing Monel Metal, designed with an 1/8" extra thickness of metal in the submerged portion to permit a corrosion rate of .012" per year and still have adequate mechanical strength after 10 years of service. Complete engineering data available on request.

THE LEWIS WELDING & ENGINEERING CORP.

Engineers · Designers · Fabricators · Machinists

BEDFORD · OHIO

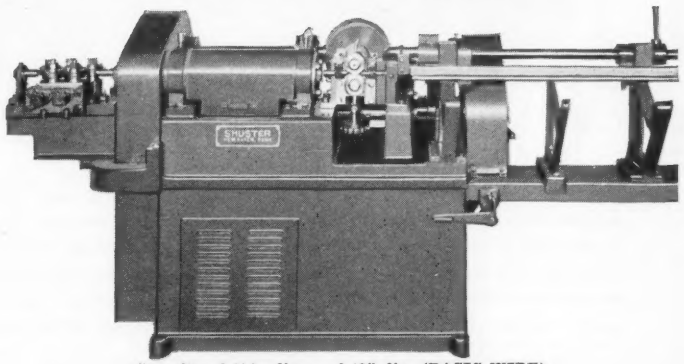
This New, Economical "SHUSTER" *Cuts Costs* AND *Accurate Lengths!*

Model 2AB

Automatic

WIRE STRAIGHTENING AND CUTTING MACHINE

This new "SHUSTER"—with its five gear-driven straightening rolls—handles even badly twisted wire with ease. Square and rectangular as well as round wire may be straightened and cut to exact lengths. Other "Shuster" features that assure high speed, quality production are: almost continuous wire travel, rapid cut-off, V-belt motor drive, ball and roller bearings, and extreme rigidity throughout. .025" to 11/16" diameters. Write for details.



Capacity: 3/16" dia. — 3/8" dia. (BASIC WIRE)

Mfd. by METTLER MACHINE TOOL, INC., 132W Lawrence St., New Haven, Conn.

SHUSTER *Automatic*

Since 1866

WIRE STRAIGHTENING AND CUTTING MACHINES

Representatives in all principal cities and in foreign countries.

Vandenbree Made Assistant Sales Manager by Standard Machinery

KENNETH VANDENBREE has been appointed Assistant Sales Manager of **The Standard Machinery Company,** Mystic, Conn., manufacturers of extruding machines for the rubber, plastics and insulated wire industries, it has been announced by Norton C. Wheeler, president.

★ ★ ★

MR. VANDENBREE studied at Bucknell University and for seven years was Director of Sales for John Royle & Sons and a contributor of articles on extrusion for Modern Plastics Catalog and other publications.

★ ★ ★

Bennett Heading Sales for National Electric Products

ROBERT C. BENNETT, JR. is the new vice president and sales manager of **National Electric Products Corp.,** Pittsburgh.

★ ★ ★

IN making this announcement, W. C. Robinson, Jr., vice president, said Mr. Bennett was also named a member of the company's board of directors. He has taken over the responsibilities of Harold J. Newton, recently retired.

★ ★ ★

Pittsburgh Screw & Bolt Corp. Appointments

PITTSBURGH SCREW & BOLT CORP., Pittsburgh, elected as vice presidents **Harry W. Schuetz, Gerald J. Garvey,** and **George E. Horney.** Mr. Schuetz has been assistant to the president and general manager of the Colona Division, and is now in charge of that division with office at the Monaca, Pa., plant. Mr. Garvey, now vice president in charge of the Gary Screw & Bolt Division, was for many years a member of that division's sales staff and in the last few years was general manager of the Gary operation. Mr. Horney, who formerly served as general manager, Gary Division, was more recently assistant to the president of the corporation, with offices in Pittsburgh. **Albert N. Williams** was elected to the board of directors. He is president and a director of Westinghouse Airbrake Co. and of Union Switch & Signal Co.

★ ★ ★

A. S. & W. Advances Two Men

PROMOTIONS involving two men, long associated with engineering activities of the **American Steel & Wire Company,** were announced in May by **George A. Gleason,** Worcester district manager of operations.

★ ★ ★

ALBERT P. HAYDEN becomes superintendent of wire rope and tramway engineering and **John A. Herr** advances to the position of assistant superintendent of this department.

★ ★ ★

IN his new capacity, Mr. Hayden succeeds **Gordon H. Bannerman,** nationally known aerial tramway engineer, who recently became manager of a newly created tramway division of Columbia Steel Company, western subsidiary of United States Steel. Mr. Hayden joined the Wire Company at Worcester in 1927 as a designer in the tramway department. Mr. Herr became associated with the American Steel & Wire Company at Worcester in 1925, assigned to the rope engineering office.

★ ★ ★

anneal wire the MODERN way!

You'll save money, you'll improve efficiency along many lines with the unique Ajax Electric Salt Bath wire annealing method. It requires less floor space, less labor, less maintenance. Heating cycles average less than 20 minutes, even on difficult jobs. There is no scaling, no decarburization, no explosion hazard, none of the bothersome problems entailed with atmosphere equipment. Salt bath treating does the work faster, better, cheaper!

Ideal for annealing low- or high-carbon and stainless steel wire and rod; annealing aluminum, and copper and silver alloys; and for descaling stainless and alloy steel wire in molten salt baths.

AJAX ELECTRIC COMPANY, INC.
Frankford and Delaware Aves. · Phila. 23, Pa.
The World's Largest Manufacturer of Electric Heat Treating Furnaces Exclusively

WRITE FOR YOUR COPY!
This 72-page Ajax booklet tells the entire story of salt bath heat treatment as applied throughout modern industry. Ask for Booklet 116.

AJAX HULTGREN ELECTRIC SALT BATH FURNACE

Fay Henry Willey

THE untimely death of **F. H. Willey** founder and president of **Willey's Carbide Tool Company,** Detroit, Michigan, manufacturers of tungsten carbide tools and dies, is noted with very sincere regret. He passed away on May 6th at the age of fifty-three.

* * *

F. H. Willey.

* * * * *

MR. WILLEY was born in Weston, West Virginia and resided at Willey's Acres, New Brighton, Michigan. He was well and widely known as one of the pioneers in the development of the tungsten carbide industry and was also well-known in the industrial diamond business.

* * *

MR. WILLEY had built a substantial business of national proportions and was widely esteemed for his knowledge of the tool and die business.

* * *

L. D. Holland

THE death of **L. D. Holland,** Assistant to the President and a member of the Board of Directors of **E. F. Houghton & Co.,** Philadelphia, occurred on April 14 after a long illness. He was 46, and had been connected with Houghton since 1927 as sales representative, Western Division Sales Manager, Manager of Research Sales and Assistant General Sales Manager.

* * *

Riverside Metal Names Pittsburgh Distributor

THE RIVERSIDE METAL CO. of Riverside, N. J., has appointed the **William M. Orr Co.** of 1230 Brighton road, N. S., Pittsburgh, Pa., as a warehousing distributor in western Pennsylvania, eastern Ohio, and West Virginia, where the company is an important supplier of quality copper-base alloys. The appointment marks another step in the current program of extending the company's warehousing facilities and expediting delivery to customers. The new distributor will augment customer service provided by the company's Cleveland office.

* * *

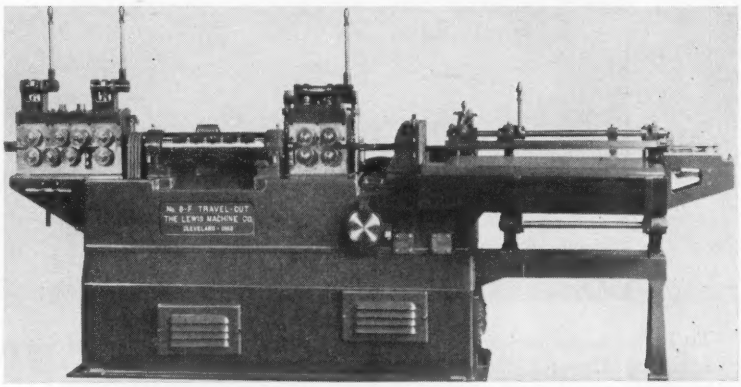
Philips Promotes Lowit

RUDOLF LOWIT has been elected by **North American Philips Company, Inc.,** as Vice President in charge of its Elmet Division, according to an announcement by Pieter van den Berg, President. Mr. Lowit was formerly General Manager of the division which is located at Lewiston, Maine.

* * *

CUT YOUR CUTTING COST WITH

LEWIS TRAVEL-CUT



Wire Straightening & Cutting Machines

The simplicity of design and rigid construction of the Lewis Travel-Cut makes it well suited for the most severe high-production requirements. This machine feeds the wire from the coil, straightens, gauges to accurate length, and cuts while in motion thus producing uniform diameter rod free of arbor swell and feed roll marks. It is particularly adapted to precision work on bright finished steel, brass, aluminum, stainless, and alloy wire. This method of cutting is also very efficient for short lengths such as welding rod, special bolts, etc., and increases the over-all efficiency approximately 20% over the conventional type of cut-off.

Machines built in various sizes to handle from 1/16" up to 3/4" diameter, and 1/16" to 5/8" square or equivalent area in hexagon and flat.

Exclusive Representatives

EAST: Penn Machinery Co., 117 North Third Street, Philadelphia 6, Penn.

MIDDLE WEST: Steel & Wire Machinery Co., 1017 Helmsdale Rd., Cleveland 12, O.

CENTRAL: Moslo Machinery Co., 2443 Prospect Avenue, Cleveland 15, Ohio.

WEST COAST: Hoffman & Heartt, 3005 So. Grand Ave., Los Angeles 7, California.

CANADIAN: Empire Engineering Co., 11 Wellington St. E., Toronto 1, Ontario.

CONTINENTAL EUROPE: Gaston E. Marbaix, Ltd., Devonshire House, Vicarage Crescent, London S. W. 11, England.

The LEWIS MACHINE Company
3441 E. 76th Street, Cleveland 4, Ohio

Also agents in Paris, Stockholm, Rotterdam, Brussels, Zurich, Milan, Bombay and Melbourne

THE Elmet Division produces tungsten and molybdenum in many forms; fine wire and metallurgical specialties.

★ ★ ★

New Baking Finish for Brass

A NEW anti-corrosive clear baking finish for brass and brass products has been developed by the Finishes Laboratories of **Standard Varnish Works,** New York, according to an announcement by **Carl Bauer,** Standard's manager of Industrial Sales.

★ ★ ★

NAMED "#7318 CLEAR BAKING FINISH," the new coating is recommended for builders' hardware, cosmetic cases, lighting fixtures, marine fittings, luggage hardware — wherever brass or brass plating is employed.

★ ★ ★

WITH the aim of establishing the versatility of the new clear finish, Standard finishing engineers subjected applied samples to punishing tests for abrasion, perspiration, humidity, and for moisture and salt spray resistance. Results of these tests, attested by a comprehensive Standard Varnish Works Technical Bulletin, showed conclusively that the new finish affords outstanding protection against all these chemical and physical abuses. The announcement pointed out that economy and ease of application are doubly important to the manufacturer of **small** metal products.

★ ★ ★

FURTHER details including the comprehensive Technical Bulletin mentioned above may be obtained by writing Industrial Sales Department, Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, New York

★ ★ ★

New Tank Protection Developed

A NEW flame-sprayed resin coating called "Nukemizing" has been developed by **Nukem Products Co.,** 111 Colgate Ave., Buffalo 20, N. Y.

★ ★ ★

THIS coating used on plating, pickling storage and other tanks, provides a tough, dense and impenetrable membrane that gives complete protection to tank surfaces against acid corrosion.

★ ★ ★

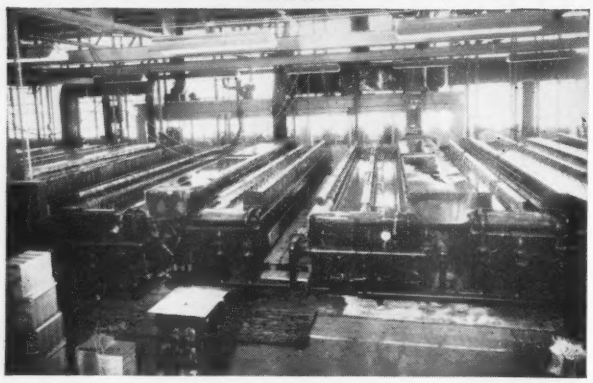
NUKEMIZING is offered as a complete application service, not a product to be sold to and applied by a customer.

★ ★ ★

FULL details as to characteristics and costs will be furnished by the company.

★ ★ ★

This Program Gives You PERMANENT PROTECTION *Against Corrosion* During METAL FINISHING!



To help you *permanently* control corrosion of equipment used for metal finishing, Haveg Corporation offers you this 2-point program:

1. Personal cooperation in the engineering and installation of Haveg tanks and other equipment
2. Complete manufacturing facilities to mold Haveg equipment to fit your individual needs

This means a *permanent* solution to your corrosion problems during metal finishing. That's because molded plastic Haveg is resistant throughout its entire mass to practically all solutions used for finishing metals. Moreover, you have equipment virtually tailor-made for longer service life, improved production. Many standard shapes available—including tanks, piping, fittings, valves, etc. Write for new Haveg Engineering Bulletin F-6.

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Send in

Your Order Now

for the

1950 Wire Buyers Guide

A Review of Recent Wire Patents

NO. 2,503,149, DOUBLE-SPIRAL SPRING, patented April 4, 1950 by Daniel Emile Augustin Bonnemort, Romainville, France.

Adapted for electric circuit-breakers, change-over switches and the like, this spring is constituted by a single flat spring blade spiralled first in one direction through one half of its length and then into the other direction through the other half of the blade, the two spiral halves being connected through a short flat portion of the blade, the outer ends of the two oppositely spiralled halves of the blade being directed radially outwards for actuating purposes, and the two halves arranged coaxially in adjacent paralled planes.

★ ★ ★

NO. 2,503,374, REEL, patented April 11, 1950 by Arthur A. Bureau, Chicago, Ill., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

This reel comprises a drum with an annular head formed of sheet metal, having an integral inner flange engaging the drum and secured thereto an internal rim flange, and a plurality of reinforcing members separate from the head and spaced therearound and extending obliquely from the outer edge of the inner flange to the inner edge of the rim flange and being bonded thereto.

★ ★ ★

NO. 2,503,811, KNOCKDOWN CRATE FOR SHIPPING, STORING, AND OTHER HANDLING OF MERCHANDISE, patented April 11, 1950 by Lawrence F. Emigholz and Charles C. Averill, Albion, Mich., assignors to Union Steel Products Company, Albion, Mich.

The crate is made up of crossed sets of wire slats. There are 16 claims.

★ ★ ★

NO. 2,503,859, HOLDER FOR DISPENSING CARTONS, patented April 11, 1950 by Laurence F. Webber, Ann Arbor, Mich.

A holder, wholly of wire is provided for dispensing cartons having an opening in a wall thereof through which the contents may be withdrawn.

★ ★ ★

NO. 2,503,987, WIRE STRANDING DIE, patented April 11, 1950 by Evald F. Anderson, North Oxford, Mass., assignor to The American Steel and Wire Company of New Jersey, a corporation of New Jersey.

This assembly comprises a rotatably mounted stranding head having a device for guiding wires, a stranding die axially aligned in spaced relation with respect to the stranding head to rotate therewith and annular floating means adjacent the stranding die in advance of the point of twist for guiding wires from the stranding head to the stranding die, the stranding die including a pair of freely rotatable die sheaves and a device for adjusting the spacing of the sheaves.

★ ★ ★

NO. 2,504,020, STRAND TENSIONING APPARATUS, patented April 11, 1950 by Estyle D. Hanson, Baltimore, Md., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

More specifically, a new high-speed serving head brake is provided.

★ ★ ★

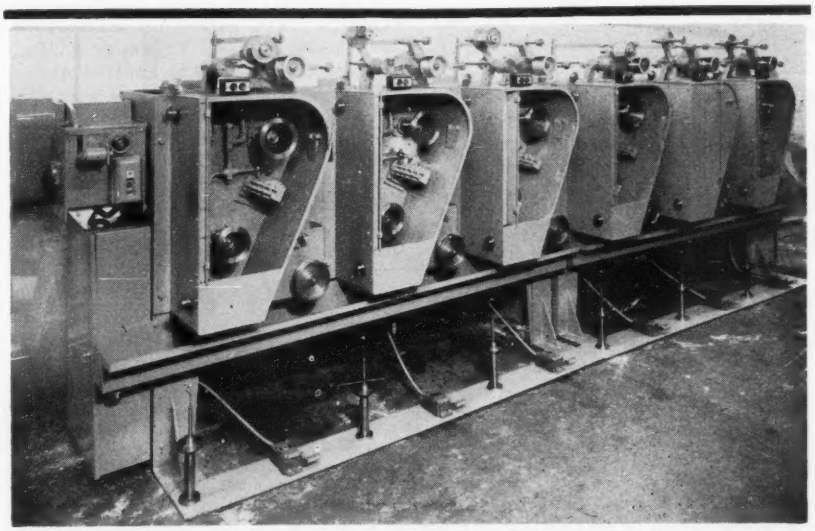
NO. 2,504,600, MANUFACTURE OF CABLES SHEATHED WITH LEAD BASE ALLOY, patented April 18, 1950 by Clermont J. Snyder, Hastings on Hudson, N. Y., assignor to Anaconda Wire and Cable Company, a corporation of Delaware.

The method covered is for subsequently treating cable sheathed with a lead base alloy which becomes hardened upon heating to a temperature in the range from 350° F. to 525° F. and then quenching, including passing the cable through a lead press and extruding a sheath of the lead base alloy thereon.

★ ★ ★

NO. 2,504,845, METHOD OF MAKING INSULATED ELECTRICAL CONDUCTORS, patented April 18, 1950 by John J. Keyes, Pittsburgh, Pa., assignor

Complete Description and Drawings of Patents May Be Had for 50 cents, outside the United States and Canada $1.00. Address, Wire & Wire Products, 300 Main St., Stamford, Conn.



FINE WIRE DRAWING MACHINE
No. 934

For volume production on minimum floor space.
Individual Motor Drives.
Ball-Bearing Mounted Throughout.

EST. 1855 AIMco INC. 1915
"American" AIM INSULATING MACHINERY COMPANY
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PHILADELPHIA PENNSYLVANIA U.S.A.

Please write for details. We are always at your service.

Builders of machinery for the Wire Industry

to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania.

This method is for insulating wire conductors with staple glass fibres in the form of a sliver or yarn and a resinous binder to provide smooth, closely bound insulation.

★ ★ ★

NO. 2,504,947, WIRE BUNDLING STAND, patented April 18, 1950 by George A. Grange, Libertyville, Ill., assignor to The American Steel and Wire Company of New Jersey, a corporation of New Jersey.

Above a suitable stand is an upwardly extending roller and a pair of downwardly divergent rollers radially disposed in a common inclined plane, and a pair of parallel rollers extending outwardly between the extremities of the divergent rollers having their axes normal to this plane.

★ ★ ★

NO. 2,504,987, PIN SETTING MACHINE AND METHOD, patented April 25, 1950 by Rudolph Krah and Walter W. Block, Kenosha, Wis.

A machine is provided and adapted to insert the end of a wire into pierceable material and to leave a predeterminedly shaped portion projecting outwardly therefrom.

★ ★ ★

NO. 2,505,415, NAIL AND TACK MAKING APPARATUS, patented April 25, 1950 by Louis Lukancic, Joliet, Ill.

The apparatus comprises a rotatable table having radially-disposed spaced-apart mold cavities in its surface with an overlying distributor for molten metal operatively associated with the cavities. There are also a magnetic drum rotatably mounted above the table to remove molded articles from the cavities, a non-magnetic driving drum rotatably supported adjacent this magnetic drum and an endless non-magnetic foraminous belt entrained over the drums to receive, at its reach, entrained over the magnetic drum, the molded articles and convey them away from the drum.

★ ★ ★

NO. 2,505,627, PROCESS OF CLEANING AND TINNING ELECTRICAL CONDUCTORS, patented April 25, 1950 by Leopold Pessel, Philadelphia, Pa., assignor to Radio Corporation of America, a corporation of Delaware.

This process is directed to tinning the surface of a metallic electrical conductor insulated with a film of acetone-insoluble polyvinyl acetal synthetic resin and comprises treating the film with molten pyrogallol and then immediately thereafter applying molten solder to the treated film.

★ ★ ★

Men who have achieved success because they were alert and aggressive and those who are dissatisfied enough to want to get ahead, are the men in the wire industry who subscribe to WIRE AND WIRE PRODUCTS. When you ADVERTISE to them you are reaching a select, alert audience, whose good opinion of your products counts. Therefore, ADVERTISE in WIRE AND WIRE PRODUCTS.

ROYLE *for WIRE INSULATING*

- Continuous Vulcanizing Machines for Rubber Wire Insulation
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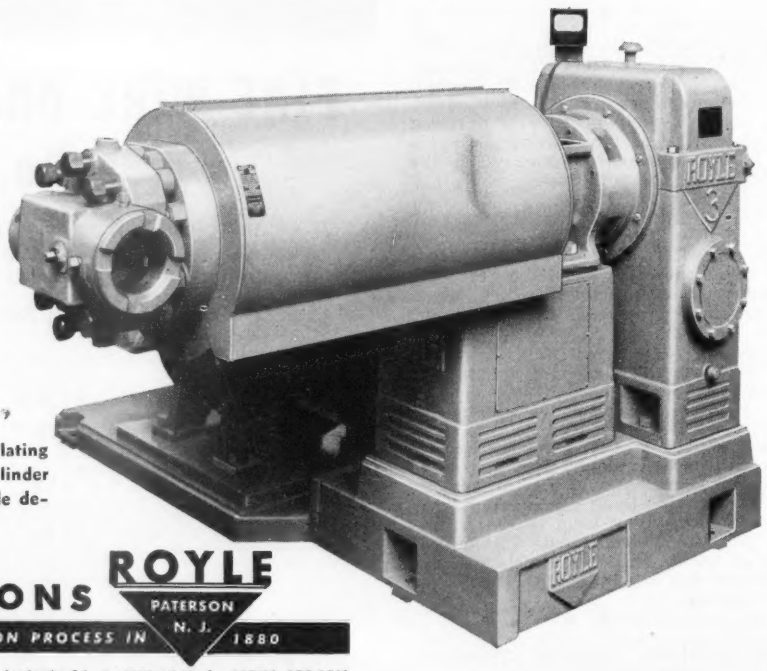
- Motorized Take-Ups
- Temperature Control Units for Extrusion Processes and other industrial uses



ROYLE # 3 Plastic Wire Insulating Machine. Double extended cylinder enclosed in insulating jacket, side delivery head.

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England — James Day (Machinery) Ltd. — REgent 2430
Home Office — J. W. VanRiper — SHerwood 2-8262
Akron, Ohio — J. C. Clinefelter — JEfferson 3264
Los Angeles, Cal. — H. M. Royal, Inc. — LOgan 3261

PATERSON 3, NEW JERSEY

The Business of Cold Heading

(*Continued from page 501*)

also, so the selection of the steel for the job may not be all that is desired. Most present day designers of mass produced items such as appliances, automobiles, etc. plan to utilize all the strength available in a low carbon steel. They use alloys only when necessary. This fact forces us to try to obtain, at minimum cost, the most desirable characteristics of the steel so we can use it.

* * *

BACK to our offset head—The wire has to be a compromise on hardness, generally about Rockwell B 88 or 85,000 #/ in. sq. tensile before heading. It has a dry stearate coating suitable for double extrusion but not as heavy as is normally used, due to the shoulder that has to be filled out. The wire must be earmarked for the job and segregated since "just any wire" will not work. It has to be inspected for seams and pipes by the laboratory. The headed blanks should be checked to be sure the upset is correct and the metal has "flowed" instead of tearing or shearing. We must accomplish a second extrusion, (on the tip), to prepare it for flattening. After trimming, a stress relieving heat treatment is accomplished and the end (now softer) is flattened. To make sure the blanks are straight, the shank is blank rolled before the thread is rolled. Inspection and packing follow.

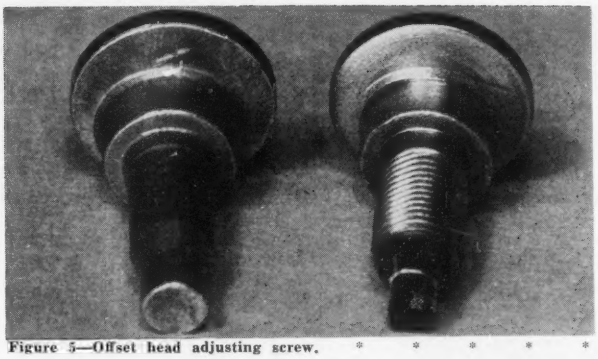


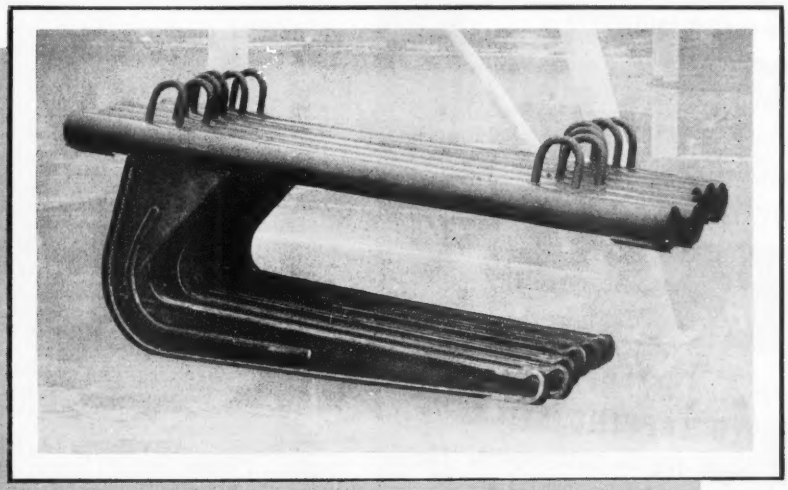
Figure 5—Offset head adjusting screw.

* * *

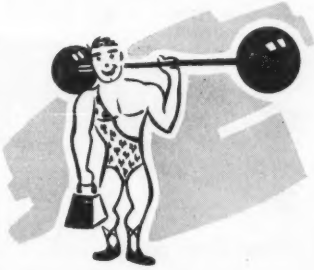
Engineering and "Know How" Are Essential

SINCE all of this is part of the work, Lamson and Sessions has spent time and money investigating the various aspects of standard parts as well as "specials." Each job was initially a challenge, but constantly working with the various processes we have been able to write specifications and arrange operations as outlined above to best handle the situation.

* * *



designed for **HEAVY-DUTY** service . . .



WELDCO Lightweight *Hairpin* Hooks

● These Weldco lightweight Monel pickling hooks are now in use in a New York wire mill, where they replaced bulky, old-style equipment. The hooks are 10′ 8″ long, and handle up to 3,000 pounds each; they're so corrosion-resistant that, although they are used constantly in hot 7½% sulphuric acid, they outlast heavy cast hooks 2 to 3 times.

Wire mills throughout the country prefer Weldco hairpin hooks because of their lightweight, toughness, corrosion-resistance, and long service life.

Why not find out what these economical, heavy-duty pickling hooks can do for your plant? Write, phone, or wire us today.

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY

3706 OAKWOOD AVENUE YOUNGSTOWN 9, OHIO

A FINE coil of wire soon finds its way back to the Open Hearth as scrap, if organized know-how is not applied before it leaves the wire mill. From there on in we must constantly check to see that it is properly handled, as ordered by those men who devote their efforts to "The Business of Cold Heading."

★ ★ ★

Bulletin on Anti-Rust Materials and Methods

HOW to combat rust throughout the production process in metal-working plants is the subject of a special Service Report just published by **Oakite Products, Inc.**, New York, manufacturers of industrial cleaning and allied materials.

★ ★ ★

THIS Service Report offers a concise description of specialized materials and procedures that (1) remove rust from raw stock; (2) clean and derust in **one** operation; (3) prevent rust while parts are being processed; and (4) prepare metal for paint while affording protection against rust before and after painting. Also reported upon are materials, for use by machine or tank methods, that remove buffing compounds, drawing and stamping compounds, cutting and grinding lubricants, mill and slushing oils, solid-particle dirts and smuts from metal parts, and at the same time provide efficient temporary protection against rust.

★ ★ ★

INDUSTRY personnel desiring copies of this new Service Report may obtain them, without charge, by writing to Oakite Products, Inc., 152A Thames St., New York 6, New York.

★ ★ ★

Summer Electroplating Courses

THE JOSEPH B. KUSHNER ELECTROPLATING SCHOOL, Stroudsburg, Pa., announces the inauguration of three, intensive one week summer lecture courses on special electroplating subjects, to be given in Stroudsburg, Pa.

★ ★ ★

THE course subjects and dates are as follows:

WEEK OF AUGUST 6. MODERN ELECTROPLATING PRINCIPLES. A comprehensive survey of the theoretical principles behind modern electroplating practice. High school education or better required.

WEEK OF AUGUST 13. GOLD PLATING TECHNIQUES AND PROBLEMS. Special techniques and modern methods in gold plating. An intensive lecture course for those with previous experience and knowledge in gold plating, only.

WEEK OF AUGUST 20. RECENT DEVELOPMENT IN ELECTROPLATING. A thorough survey of new and recent developments in electroplating and their importance. The direction of future trends in electroplating. Lecture course for executives, chemists and engineers.

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WIRE DIES AND TOOLS
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√ 26 engineered grades
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√ 2 unit sizes — 18 and 5 gram
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A Difficult Die Hyprez Finished To Perfection
Only HYPREZ Can Do a HYPREZ Job!
Write for free HYPREZ LAMINATED LAPPING STICK
Available in 6" length, 1/8" to 3/16" square, and rectangular. Any size may be rounded or pointed for fine detail.
For free demonstration or Hyprez lapping stick write Dept. W-650.
HYPREZ DIVISION
ENGIS EQUIPMENT CO.
431 S. Dearborn St. Chicago, Ill.

Thin Metal Parts Successfully Heated by Induction

(*Continued from page 499*)

the work piece and heating coil and electrically insulated from the coil, it was found that the electromagnetic field produced by alternating current in the load coil, successfully heated both the metal barrier and the work piece by induction. It became evident also that the metal cylinder could serve both as a heat barrier or as a heat radiator, depending upon the relative temperatures of the special cylinder and the work piece.

★ ★ ★

Typical Coil Design

FIGURE 4 shows the front and plan views of a coil assembly designed to heat thin wires. The coil assembly consists primarily of an inductor coil (1) made of hollow copper tubing and water-cooled during use, and a metal heat barrier or radiator (3) located within the coil by means of wires (4) welded to it and electrically insulated from the coil by a ceramic tube (2). A longitudinal slot (6) in the metal radiator prevents complete shielding of the wire specimen (5) from the magnetic field and allows it to be heated by induction when high frequency alternating current is applied to the inductor coil by a standard Lepel converter operating at a frequency of approximately 300 KC per second.

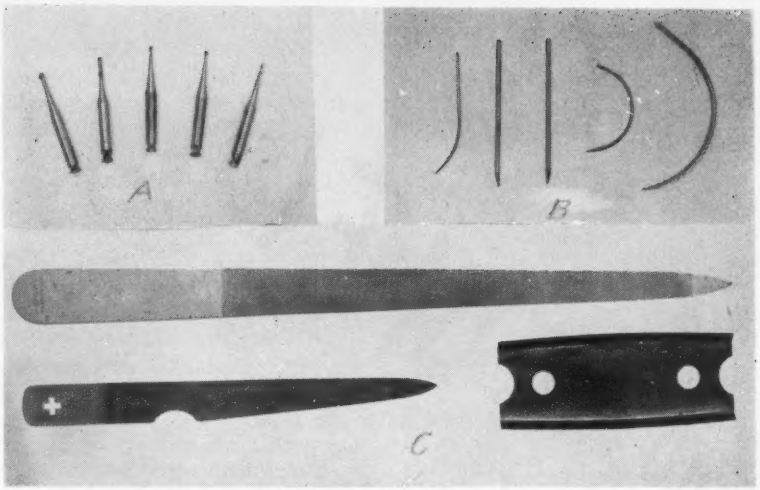
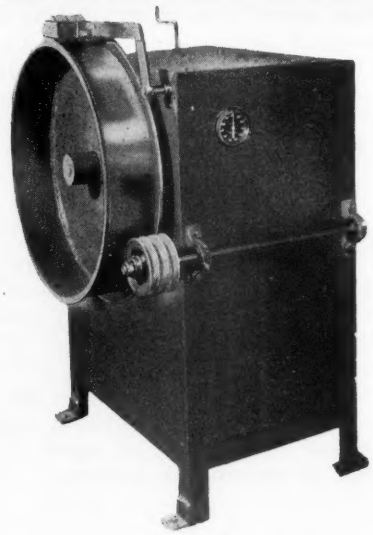


Figure 5—Variety of small parts heat-treated with Lepel Converter: a) dental burrs; b) surgical needles and cannula: c) files and scraper blade.

★ ★ ★

IN normal **operation,** the metal cylinder is maintained at a temperature higher than that required



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A polyphase motor drives a variable speed unit with a ratio of 16 to 1, which will give a range of 75 feet minimum to 1200 feet per minute maximum. The maximum speed can be increased to 1800 F.P.M., which will make the minimum speed 115 F.P.M. It is fast, rugged, dependable.

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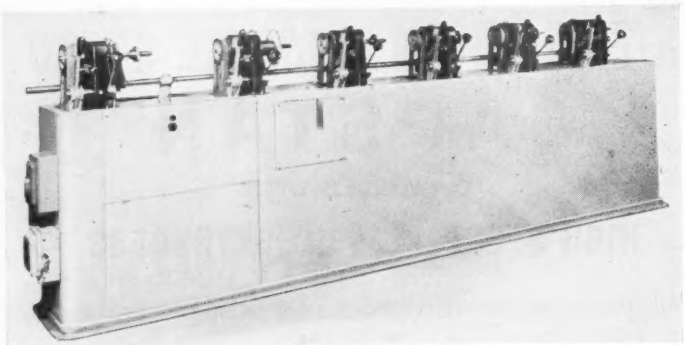

NO. 1900K MULTIPLE SPINDLE SPOOLER

This spooler is outstanding for its many unusual and desirable features.

Takes spools up to 16" flange diameter. Enclosed type, with mechanism readily accessible from rear side. Spindles mounted on ball bearings and each may be stopped or started individually. Uses Worthington All-Speed Drive unit.

All Emory Spoolers supplied standard or equipped to meet customers' special specifications.

On Spooling problems, consult

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in the work piece. Under these circumstances the part heats rapidly by induction to a temperature determined by its ability to absorb induced energy, and then by radiation to the final temperature desired. For steel parts the major proportion of the heating is by induction, since even very thin pieces heat to the transformation temperature or the Curie temperature, i.e., approximately 1335-1400° F, without difficulty. For non-ferrous materials, the proportion of the heating attributable to induction depends primarily upon the size of the piece. In any event, the heating times are very short since the mass of metal to be heated is small.

★ ★ ★

Temperature Control

AN interesting feature of the special coil arrangement shown in Figure 4 is the ability to control the temperature of the heating operation. For example, the temperature of the metal radiator depends upon its thickness, the magnetc permeability and electrical resistance of the material from which it is made. Using a material such as Inconel for the metal radiator, it is possible to control the maximum temperature of the operation by selecting a suitable thickness for the radiator.

★ ★ ★

ACTUALLY, this temperature control is important primarily as a safeguard for continuous operations, i.e., in heating wire continuously, where a mechanical difficulty might cause serious overheating or even melting. In general practice, the length of the heating cycle may, as usual, be used to control the process.

★ ★ ★

Applications

WITH the use of the special coil discussed, fine wires of any conducting material, i.e., iron, steel, copper and aluminum, can be heated uniformly to all temperatures required for successful heat treatment. A number of other small parts hardened successfully

Product of MODERN SCIENCE and MASTER CRAFTSMANSHIP

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DIAMOND DIES

● The tools of modern science are combined with the skills of the master craftsman in the production of PHILIPS *master-made* Diamond Dies.

Every diamond selected for cutting is examined by PHILIPS X-ray diffraction apparatus to determine the proper direction for drilling to provide longer life and greater satisfaction to the user. Master craftsmen of long experience, working under the most modern conditions, drill each diamond to precision tolerances. Result? The finest diamond dies obtainable—now available to American industry under the trade name of NORELCO Diamond Dies.

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using modifications of the principle described are shown in Fig. 5. They include surgical needles, dental burrs, fingernail files, stainless steel cannulas and thin scraper blades ground to a knife edge.

★ ★ ★

Conclusion

THE use of a heat radiator in connection with the design of work coils for induction heating, extends the use of conventional converters to a field of parts previously heat treated unsuccessfully. The class of metal parts affected include small, thin parts, i.e., .030" and less in thickness, too small to absorb sufficient induced energy to balance heat losses. Although such parts have previously been heated successfully, using very high frequencies, i.e., 27 to 140 megacycles, it is believed that the use of a heat radiator with a conventional coil and a standard converter provides considerably greater flexibility in operation.

★ ★ ★

C. F. & I. to Move Next Year to New Offices

CARL W. MEYERS, president of Colorado Fuel and Iron Corporation states that the corporation has taken a long term lease on the entire 14th floor of the new 25-story Uris Brothers Building now under construction in Manhattan.

★ ★ ★

THE corporation will move to its new quarters early next year when the building at 575 Madison Avenue is completed. The new space will be used as the executive office of **Colorado Fuel and Iron Corporation** and as the executive office and New York district sales office of its **Wickwire Spencer Steel Division.** The corporation, currently the nation's tenth largest manufacturer of steel and a large fabricator of rails and wire products, operates eight plants and numerous iron and coal mines.

★ ★ ★

MR. MEYERS states that the move from the present address at 500 Fifth Avenue, where

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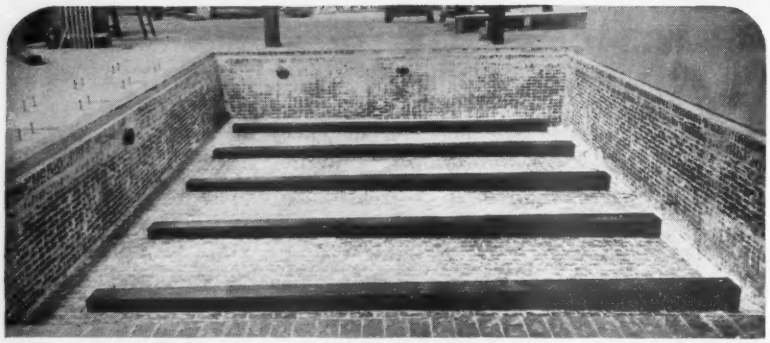

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Our quarter century of experience is your guarantee of performance. When you plan construction of new pickling tanks, neutralizing tanks, floors, process tanks or fume ducts write for recommendations concerning your specific operating conditions. Representatives in most principal cities.

Ceilcote Products include acid and alkali proof— • Linings • Membranes • Bonding Cements • Brick • Protective coatings

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executive headquarters have been located for the past 12 years, was made necessary by the desire to consolidate the corporation's New York offices on a single floor in a new air conditioned centrally located building.

★ ★ ★

Western Steel & Wire Co. Starts Construction on New Manufacturing Plant

WESTERN STEEL & WIRE COMPANY has started construction of a new one-story manufacturing plant at 1410 Egbert Street near Jennings, president **E. G. Stevens** announced recently.

★ ★ ★

THE 12,500 square feet plant will provide one-third more space than the present factory on San Bruno Avenue. A substantial production increase is expected from the installation of new wire forming machines, he said.

★ ★ ★

Tennis Nets to Fences

FIFTEEN years ago, the **Page Steel and Wire Division** of **American Chain and Cable Co., Inc.**, sold some chromium-nickel Stainless Steel tennis nets. For years, these nets have resisted abrasive sand and marine atmosphere with little effect. As a result, this company now sells large quantities of Stainless Steel fencing mesh, particularly for farms and cattle ranches where salty marshlands must be fenced off.

★ ★ ★

Send in

Your Order Now

for the

1950 Wire Buyers Guide

Correction

ON page 327 of the April issue of WIRE AND WIRE PRODUCTS a headline stated: "A. S. & W. and Alcoa Develop New Transmission Cable." This should have read "ALCOA Develops New Transmission Cable." The cable is a product that was developed as a result of Aluminum Company of America's research work.

* * *

Robertson Announces New "Packaged" Lead Encasing Press

A 4 page brochure has just been prepared by **John Robertson Company,** 121 Water Street, Brooklyn 1, N. Y., which illustrates and describes their new self-contained ("Packaged") Oil-Hydraulic Lead Encasing Press. This press has been developed with many innovations for use by the Cable and Rubber Hose Industries. A copy of the brochure will be sent upon request to the company.

* * *

New Catalog on Wire Working Machinery

A HANDSOME loose-leaf catalog, describing their spring coiling, straightening and cutting and other forming machinery and accessories, has been issued by **Frank L. Wells Company,** 5821 Fifth Avenue, Kenosha, Wisconsin.

* * *

THE company has been making machinery of this kind for 57 years and has already developed a line of high-grade equipment for the trade that embodies rugged dependability, speed and relative low-cost that will give long trouble-free service.

* * *

OUR readers are invited to send for a copy of this new catalog. Please ask for Catalog No. 50.

* * *

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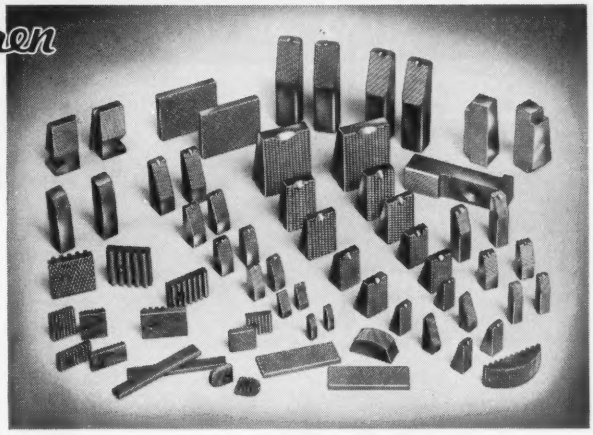

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Clean head design and accurate temperature control in these Davis-Standard Insulating Extruders assures wire concentricity. Machines for rubber and thermoplastics, including Nylon; continuous vulcanizing insulating machines; wire handling equipment. Extruding Machines for rods, tubing, profiles, straining, Nylon covering of wire rope.

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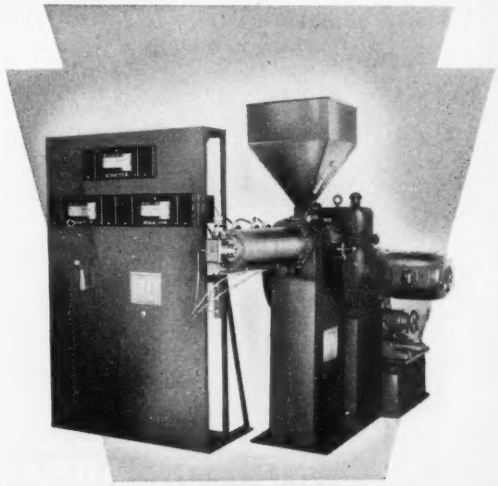
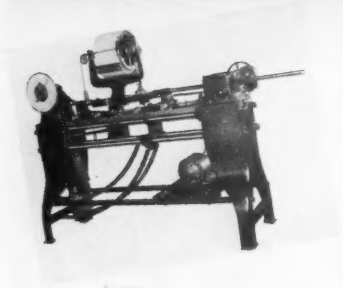
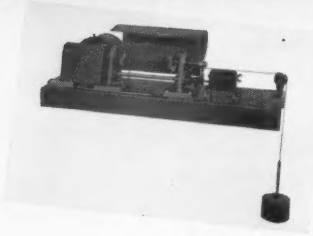
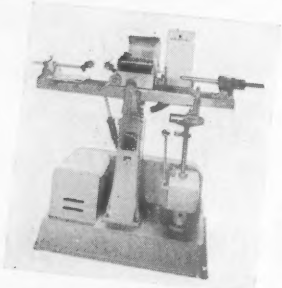


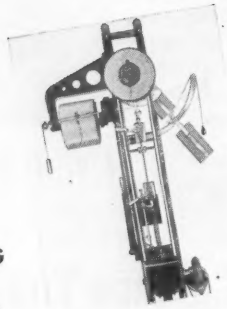
2" Davis-Standard Thermo-Plastic Extruding Machine

SCOTT TESTERS – *Serving the wire Industry*









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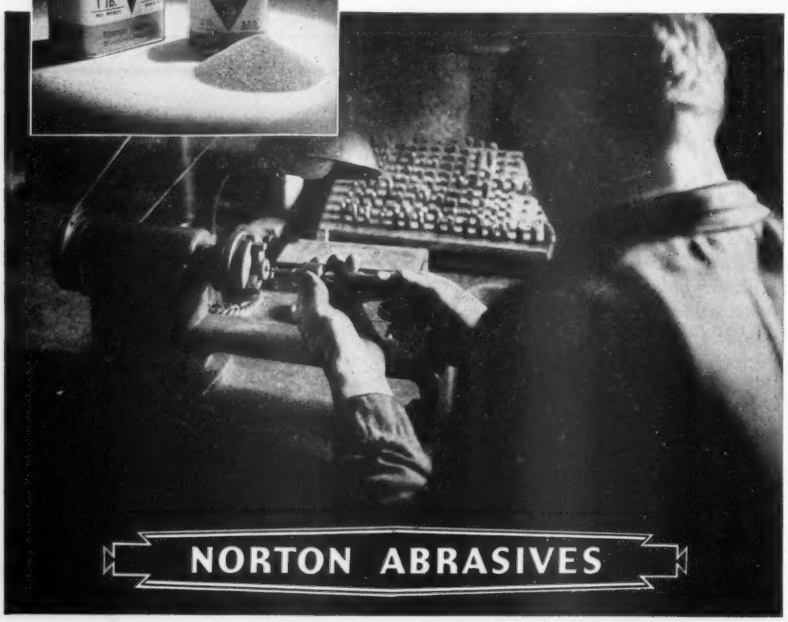
This abrasive—second only to the diamond in hardness and 150 times less expensive—does an efficient job of cutting and semi-finishing cemented carbide wire drawing dies.

NORTON CO. — Worcester 6, Mass.



Nail Production

(*Continued from Page* 491)

light indicating that the barrel can receive another charge will be illuminated.

★ ★ ★

IMMEDIATELY the controller has accepted a skip of Nails into any particular barrel he takes the card for that charge and enters the barrel number upon it and places it in a clip over the appropriate panel for that barrel. When the Nails are finally discharged to the bucket conveyor, he drops the card through a chute into the label control cabin immediately below.

★ ★ ★

Card Record System

FIGURE 10. shows a fascimile of the record card. The machine operator enters upon this card the date, size and type of Nail, the class and section of the machine in which the Nail was made, and his name.

★ ★ ★

A CARD is made out for every skip-load. The operative places his card in the pocket provided. The skip runner (trucker) takes the skip to the weighing point and initials the card. The progressive charge number and the weight are stamped upon it by the weighing machine. The card is punched to indicate the shift and the weighing machine used. The card is then divided; one half is returned to the operative, the other half is sent by "Lamson" tube to the polishing control cabin when the relevant charge is on turn before polishing. The controller enters on the card the number of the barrel in which the charge was polished and, after polishing, drops the card down the chute to the label control office.

★ ★ ★

FROM the information on the card the label-operative selects the appropriate labels and despatches both labels and card by "Lamson" tube to the correct packing point. When the packer has completed the charge he enters on the card the number of sacks or kegs derived from that

STANNOUS SULPHATE

for IMPROVED LIQUOR FINISHING of STEEL WIRE!

Stannous Sulphate, used for either straw color or white liquor finishing, provides these outstanding advantages:

1. A superior, smoother coating
2. Positive control — making it possible to produce uniform coatings day in and day out
3. Easier to use — fewer operations involved
4. Economy — requires use of less copper sulphate, less acid
5. More Economy — reduces tin losses by eliminating high tin sludging.

Write for information on how to use Stannous Sulphate to best advantage in your liquor finishing.

METAL & THERMIT CORPORATION
120 Broadway • New York 5, N. Y.

charge. He punches the card to indicate the shift and packing point and returns it, by "Lamson," to the label control office. From this point the accumulated cards are sent to the departmental office.

* * *

THIS system has been devised to ensure that the identity of the charge is maintained throughout polishing and to enable the most detailed records to be kept compatible with economy in "form-filling."

* * *

Warehouse

WE have now described the passage of the Nails from the machines through the polishing plant to the bucket conveyor which is located in the warehouse. The bucket conveyor (Figure 8, Page 490), contains thirty-one buckets, each of one cwt. capacity. Thus, the conveyor will hold as many hundredweights of Nails as can possibly be contained in one polishing barrel.

* * *

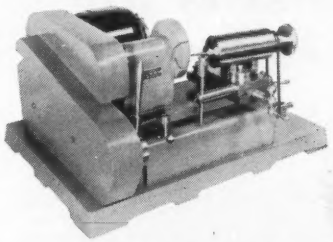
ONE man in the warehouse tends two buckets conveyors. He is employed sacking off Nails from one conveyor while the other is filling up from the weight hopper. In order to empty the bucket conveyor a stop engaging a star wheel on each bucket is put into position. As each bucket passes the stop it is inverted and the Nails which it contains fall down a chute into a sack on the roller conveyor below. Kegs can be used instead of sacks with equal facility but, for the home trade in Great Britain, sacks are used almost universally. As each sack is filled the operator passes it over the roller conveyor through the stitching machine at the same time stitching in the size and quality label. When the stitching is complete he swings it round and drops it onto a wire cargo net on a stillage.

* * *

WHEN all the buckets have been emptied the operator enters the number of full bags or kegs on the card which he has received from the label control. He replaces the card in the "Lamson"

ROOS DYKREX

MACHINE CORRECTS AND REJUVENATES YOUR DIES to original condition



IT'S MORE than a POLISHER

IT'S MORE than a LAPPER or RIPPER

It corrects the die by straightening out any eccentric entrance angles on the dies.

ROOS TOOL & Mfg. Co.
33-35 BLOOMFIELD AVENUE
NEWARK 4, N. J.

Distributed by
Eastern Carbide Corp., New Rochelle, N. Y.
Carboloy Co. — Detroit — Pittsburgh — Newark—and all Principal Cities.
In Canada — Canadian General Electric Co., Toronto, Canada

tube and returns it to the label control cabin, at the same time pressing the switch which indicates to the polishing controller that the conveyor is ready to receive the next charge. The cards are subsequently sent to the Departmental office and used for compiling stock records.

* * *

THE charge of Nails in the cargo net is picked up by an overhead crane and delivered to its appropriate stack. If the charge is required in the far bay of the warehouse, it is transferred on its stillage by an elevating "Electricar" which places the charge in a suitable position under the crane of the other bay.

* * *

Despatch

FROM the foregoing description it will be inferred that Nails are always made to stock except in the case of specialties.

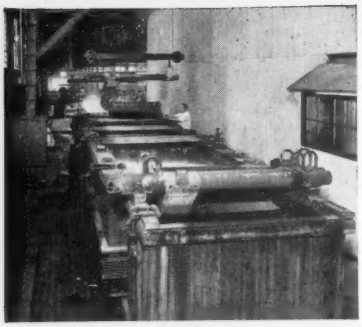
* * *

THE despatch team in the warehouse receives from the warehouse office details of daily despatches. All road despatches are made from one end of the warehouse and rail despatches from the other. The cranes and "Electricars" are used for removing the appropriate quantities of Nails from the various stacks and assembling them in their consignments at the despatch points at either end of the warehouse. Electrically driven humpers are used for loading the bags or kegs onto motor vehicles or into Railway vans or trucks. The number of sacks in each consignment are checked and this figure entered upon the order form. This form is returned to the warehouse office for the compilation of sales records, a copy being sent to the main office for invoice preparation.

* * *

Tools and Machine Maintenance

A GENERAL description has now been given of the system of Nail manufacture and the flow of work through the shop and finally some description of tool-



"Rodine" ushered in a new era in pickling. It has saved vast amounts of acid and metal all over the world.

RODINE®

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- **SAVES METAL**
- **SAVES MONEY**

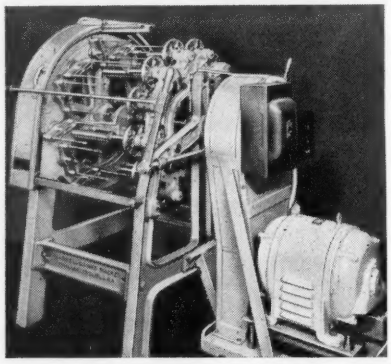
"Rodine" more than pays for itself in savings of acid and metal. Specify "Rodine" for improved pickling production.

"Cuprodine"

"Cuprodine" in a simple chemical immersion process coats both carbon and stainless steels with a thin, bright, adherent layer of copper. This coating prolongs die life and improves the drawing of wire, rod and tubing.

American Chemical Paint Co.
AMBLER ACP PENNA.

YOU CAN BUNCH
small diameter
WIRES
on the SINGLE-TWIST PRINCIPLE — Assuring
PERFECT BALANCE and EVEN BUNCH
with this
12-Spindle Horizontal Buncher



Like all H-D equipment, this machine reflects more than 80 years of "know-how" combined with the most advanced technological developments. We can help you solve many of your production problems. Write our engineering department today. This may be your first step to increased efficiency.

The limits of the twisted bunched diameter are .012" to .030". The flyer speed is 2000 R.P.M. All flyers and spindles are ball bearing mounted.
TAKE-UP SPOOL. 5" diameter x 4" traverse x 2¾" barrel. Protected capacity 10.5 lbs. Automatic adjusting tension control.
TWIST RANGE. Capstan controlled overall range 1.0" to .10" lay. Individual machine range 3.3 to 1 ratio of above. For example—.15 to .50 inch lay.
DRIVE. Motor drive with clutch pick-up for controlled starting.
FLOOR SPACE. Machine 5' 6" x 3' 6". Creel space depends on maximum number of wires being bunched.
FOOTAGE COUNTER. Can be installed to stop the machine at predetermined footage requirements. The machines are being successfully operated on Litz Wires that fall within the range of the machine, Fourdrinier Wire and many specialties where a precision bunch is required.

HASKELL-DAWES MACHINE COMPANY, INC.

Engineers and Manufacturers of Precision Twisters, Tubing Twisters, Cordage Formers and Layers, Special Twisters, Wire Strranders and Bunchers.

2231 E. ONTARIO STREET
PHILADELPHIA 34, PA.
Cable Address "DAWCO" Philadelphia

making methods may be of interest. At the time this new department was established, the use of tungsten carbide dies was not sufficiently advanced to justify their adoption. We had been studying, for a considerable period, the best types of steel for dies and cutters and the necessary heat treatment. It was decided to standardise on a high-carbon-high chrome tool steel pending the development of tungsten carbide dies.

* * *

THE tool steel is received as rolled in black trapezoidal section bars. The bars are sawn into appropriate lengths for blanks for dies and cutters and are then precision ground to the finished sectional dimensions. Dies are further processed by the milling of the wire grooves, countersinking and backing-off where necessary and the insertion of the cord indentations by hand. They are then hardened and tempered by the use of salt bath equipment and are finally sent into the correct stock bin. Cutters are milled to remove the necessary amount of stock, followed by the final grinding of the cutting edges and necessary clearances. These are then heat treated in a similar fashion.

* * *

ADEQUATE stocks of every size of tool are maintained in the tool room, for ready use; stocks are also provided in cabinets in the machine shop. Sets of tools are retained in each machine for a given number of hours and are then removed, even though they may be working satisfactorily and are returned to the tool room for reconditioning. This system has enabled us to pre-determine the amount of work to be performed by each setter, whose duties are concerned only with the tooling-up of machines and not, as before, with their feeding and general operation.

* * *

Machine Maintenance

A SYSTEM of one-shot lubrication is fitted to each machine and a charge of oil is passed through the system at prescribed

WIRE FOR WEAR
CONTINENTAL STEEL CORP.
STEEL
CONTINENTAL
WIRE
KOKOMO, IND.
• IMPROVED THROUGH RESEARCH
• PROVED IN HARDEST USE
Constant improvement through research and constant proof in toughest use have established Continental as the "wire for wear." Whether the need is for wire to stand up under difficult forming operations . . . or for a special shaped wire to provide smarter-looking, longer-lasting trim . . . Continental is the wire that wins friends and holds customers. Write us at Kokomo.
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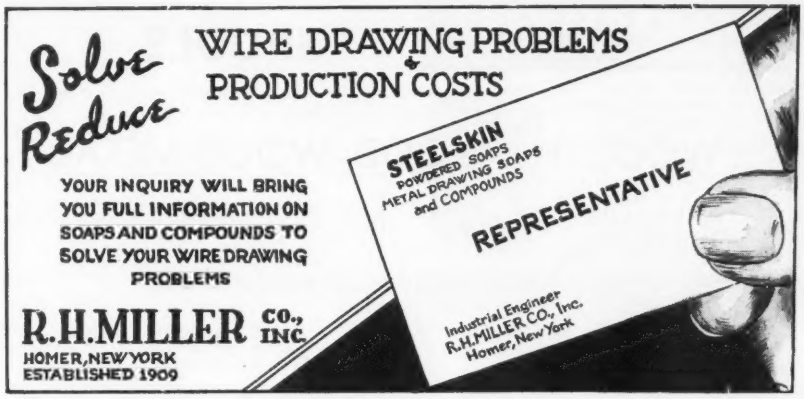

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A Special Treat

is in store for those who attend the Annual Convention of the WIRE ASSOCIATION in Baltimore, October 23rd through the 26th.

Besides five non-ferrous papers, there will be a symposium of interest to both Ferrous and Non-Ferrous members alike and a plant visit to Western Electric's Point Breeze Works. This will be the biggest technical paper diet so far presented to Non-Ferrous members.

All are cordially invited to attend and we want you to plan to come.

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pays off in performance

You boost production — help banish rejects and stoppages — when you choose Cortland Brand low carbon wires. No matter what size, finish or type you require, you'll find a Cortland Brand Wire that fits the job.

Available in all sizes . . . coils, spools, or straightened cut to length; all finishes . . . plain, galvanized, coppered or tinned; and all types . . . stone wire, bookbinder, flat wire and others. Made from best corrosion-resisting, open-hearth steel. For performance that pays off, specify Cortland Brand Wire.

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3 Watson 96" Reel, Maximum Adjusted Take-Up Stands, complete. 10-ton capacity reel.
6 Watson Submergence Compound Tanks, complete with motor.
4 Watson 48-Cop Juting Machines.
1 Watson Taping Head, 16" DE complete.
1 Watson 28" DE Steel Taping Head complete.

All Machines Reconditioned in Our Own Shop

WIRE & TEXTILE MACHINERY INC.
P. O. BOX 436, PAWTUCKET, R. I.

intervals. So far as maintenance is concerned, the several types of machines have been standardised, as far as possible, so that most parts are readily interchangeable. Adequate stocks of spares are maintained and every machine is inspected at regular intervals by a member of the Fitting Department Staff. Any necessary repairs or adjustments are then made and any parts which show signs of becoming defective are replaced. Should a breakdown occur the necessary parts are usually available from stock and any normal breakdown can be dealt with and the machine restored to running order within two hours. Because of the careful inspection and maintenance serious breakdowns are a rare occurrence and generally amount to no more than small items such as a fractured oil pipe. By this means machine availability is maintained at a very high level and the cost of maintenance is very materially reduced.

★ ★ ★

Nail Galvanising

WE have adopted for this process the standard plant supplied by the Wean Equipment Corporation. Two barrels are in operation for sixteen hours a day and the granulated zinc is made from plates on a small furnace inside the galvanising shop. The plant is efficient and turns out a very satisfactory product. The method of operation of the plant is, of course, well known and no detailed description is necessary. It is economical in the labour it employs, but considerable experience on the part of the operators is necessary in order to maintain a product of uniformly high standard.

★ ★ ★

Summary

IN this new department we have endeavored to introduce a system of Nail-making under detailed control from the bright wire to the finished product, eliminating all unnecessary labour and doing nothing by hand which can be done by a suitable machine or handling appliance. The success of our efforts can best be illustrated by the productivity of the

various people employed at all stages in the process and these details are shown in the following tables:

★ ★ ★

Table I

This table shows the economy in personnel effected in the New Shop as compared with the Old Shop:

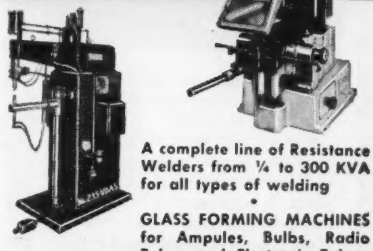
Type of Labour	Number Engaged Old Shop	Number Engaged New Shop January, 1950
Wire Supply	4.25	3
Nail Machines (Setters, Operators, etc.)	109	59
Tool Room and Heat Treatment	14	11
Polishing, Bagging, etc.	29	21
Warehouse and Despatch	19	19
Storekeeping		3
Totals	175	116
Tonnages (Approx.)	600	800
Tons per man (Average Week of 44 hours)	3.43	6.9

★ ★ ★

MACHINE OPERATIVES — AVERAGE PRODUCTIVITY PER MAN-HOUR

Size of Nail	Old Department	New Department	Increase in Output Per Man Hour
6 inch	7.244 cwts.	11.906 cwts.	64.36%
4 inch	3.658 cwts.	6.294 cwts.	72.06%
2 inch	5.412 cwts.	13.000 cwts.	140.00%
1 inch	1.122 cwts.	3.250 cwts.	189.66%

EISLER
RESISTANCE WELDERS
SPOT • BUTT •
GUN • SEAM



A complete line of Resistance Welders from ¼ to 300 KVA for all types of welding

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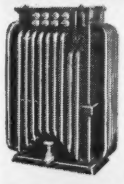
GLASS FORMING MACHINES for Ampules, Bulbs, Radio Tubes and Electronic Tubes.

TRANSFORMERS
STANDARD • SPECIAL



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Made in sizes from ¼ to 500 KVA

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SEND FOR NEW CATALOG NO. TR-50

CHAS. EISLER
EISLER ENGINEERING CO., Inc.
747 So. 13th St. Newark 3, N. J.

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It is being demonstrated by an ever increasing number of shops that Borax can be satisfactorily used as a coating on many types of steel wire. More and more shops are turning to this clean, safe, easy to handle and economical chemical.

Do this! Acid clean—Rinse *thoroughly*—Coat with Borax—Dry—Store if necessary—Draw.

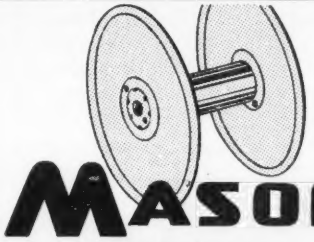
Notice this! Cleanliness about coating tank—Absence of dust in the die room—Improved die life.

Give it a trial —Others have and it does a job.

Write for Bulletin

PACIFIC COAST BORAX CO.
Division of Borax Consolidated, Limited
LOS ANGELES CHICAGO
NEW YORK CLEVELAND

MANUFACTURERS OF THE FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS



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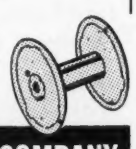
Why Mason Spools Are So Much In Demand

It's one thing to make a sturdy, non-returnable spool that satisfies the most rigid shipping requirements . . . it's quite another to offer this top quality spool to the trade at an unusually low price. Yet Mason does both. That's the big reason why more and more wire manufacturers are specifying "Mason Spools."

Find out more about Mason's high quality — low price policy today!



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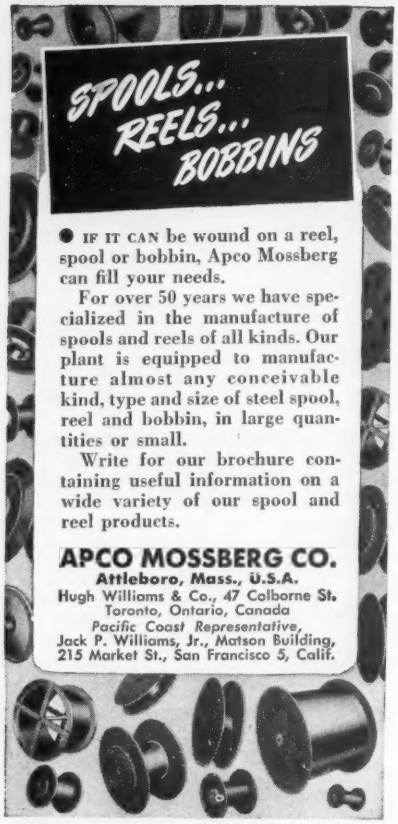

● IF IT CAN be wound on a reel, spool or bobbin, Apco Mossberg can fill your needs.

For over 50 years we have specialized in the manufacture of spools and reels of all kinds. Our plant is equipped to manufacture almost any conceivable kind, type and size of steel spool, reel and bobbin, in large quantities or small.

Write for our brochure containing useful information on a wide variety of our spool and reel products.

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Pacific Coast Representative,
Jack P. Williams, Jr., Matson Building,
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BELL-MINE

LIME

for

WIRE DRAWING

WARNER COMPANY
BELLEFONTE DIVISION
BELLEFONTE, PA.
Sales Office
Philadelphia—Pittsburgh—New York

In addition to the 116 men listed as number engaged there are an additional 43 persons variously employed, viz:

Staple Manufacture	6
Staple Warehouse	1
Shop Cleaners	4
Scrap Control	1
Office	5
Inspectors	3
Sorting (Women)	3
Cement Coating	2
Galvanising	6
Export and Special Packing	6
Supervision	6
Total	43

★ ★ ★

The relative output per man-week for all classes of labour are:

	Total Labour	Tons	Tons per Man-week
Old Shop	195	600	3.07
New Shop	146	800	5.46

FOR the Department as a whole, i.e. including all personnel, an average increase in output per man-hour of 62% has been achieved.

★ ★ ★

IT must be appreciated that the Factory is not working to capacity because of difficulties of wire supplies. For this reason the Nail Factory is only operating two partial shifts. If we were able to operate three shifts our estimated output would be 1,500 tons per week.

★ ★ ★

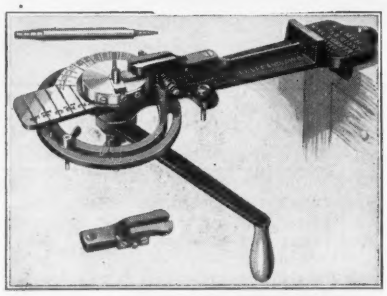
(Acknowledgment is due to Messrs. The General Electric Co. and "Mechanical Handling" for some of the photographs reproduced.)

★ ★ ★

AD THOUGHT

May we suggest that reading the ads be made a regular habit. And when you write to an advertiser for information, it helps us and identifies your inquiry to say you saw the ad in WIRE AND WIRE PRODUCTS. Will you do this?

KILMER WIRE FORMER



Forms Eleven Sizes of Eyes from Flat, Round, Square or Half-Round Stock, also Almost Any Shape Desired

Adjustable for No. 3 to No. 21 Gage Wire

The cut on right shows a few of the thousands of the forms made on this WIRE FORMER

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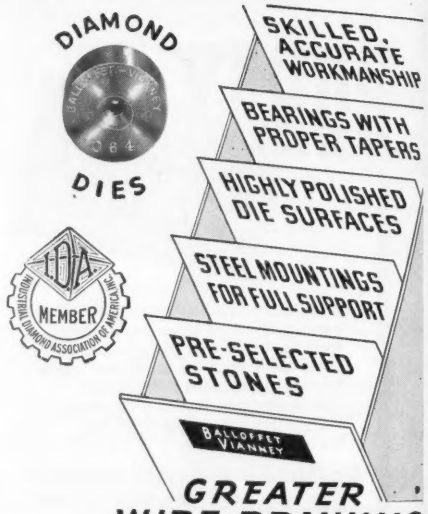

GREATER WIRE-DRAWING MILEAGE RECORD

Large stock on hand of domestic and imported dies available for immediate shipment in sizes from .0004" to .081". Literature upon request.

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DIAMOND DIES, DIAMOND POWDERS
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VICTOR J. BOULIN
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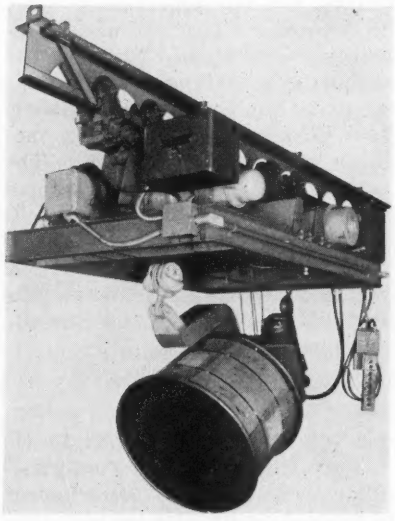
New Cable Reel Grab

CLEVELAND TRAMRAIL DIVISION OF THE CLEVELAND CRANE AND ENGINEERING COMPANY, Wickliffe, Ohio, has developed a new cable reel grab equipped with a motor-drive expanding arbor for handling 5,000 lb. reels of copper wire. The arbor, when threaded into the reel cores and expanded, holds the reels securely in any position. A double hoist carrier designed for use with the grab, hoists, convey and turns the reels.

★ ★ ★



New Cable Reel Grab developed by Cleveland-Tramrail Division of Cleveland Crane & Eng'g Company. * * * * * *

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★ ★ ★

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American Wire Mill Equipment

(*Continued from page 495*)

IN the realm of heat treatment the author notes that the Lee Wilson bell type furnace, which was just rising over the horizon in 1939, has spread-eagled the field. He describes the equipment and process in detail. In the patenting field he devotes all the space to Trauwood, with curves, photos, and photomicrographs.

★ ★ ★

IN galvanizing, after noting that several odd processes used in Europe are not represented here, he devotes his space to electrogalvanizing processes. In nails the author finds nothing new, nor does he waste any time on barbed wire. The Wean hexagon netting machine gets a full column. The author has quite clearly spent some time at Roeblings, and dwells on the clever inspection set-up which was described in WIRE & WIRE PRODUCTS some months ago, with accent on the Signode strapping machine.

★ ★ ★

IN his summary it seems to me that the author is too pessimistic regarding German chances of overtaking us. He believes that the rod mill must be in close association physically with its wire mill, ignoring the many excellent plants running here on purchased rods. He seems to feel that without new rod mills and bundles of immense weight the chances of competition are slim, but there is no word in the article about welding. He is perfectly correct in his view that the old handling methods must be swept away, but I think he associates this change with a complete re-building of the plants, and overlooks the fact that some of our best mills have accomplished the revolution right in place, and without a shutdown.

★ ★ ★

WITH the author's contention that German mills will have to get better cleaning, and to do so will have to abandon the old "basket" method of nesting rod

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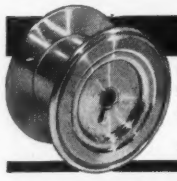
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bundles for cleaning, I am in hearty agreement, but I think he exaggerates the importance of drawing speed and of direct current. It is only about five years ago that I made a spot check of output per man in the fence sizes of wire in six of the best mills of the country, and the best figure came out of a mill whose machines were running on alternating current at the speeds of 1930.

★ ★ ★

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Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio.
Vascoloy-Ramet Corp., No. Chicago, Ill.

DIES—Diamond
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., New York, N. Y.
Cochaud Wire Die Corp., New York, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
North American Philips Co. Inc., New York, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Extrusion
Adamas, Carbide Corporation, Harrison, N. J.
Carboloy Co., Inc., Detroit, Mich.
Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
Hartley Tool & Die Co., Thomaston, Conn.
Metal Carbides Corporation, Youngstown, Ohio.
Robertson, John, Co., Brooklyn, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Eyelet
Hartley Tool & Die Co., Thomaston, Conn.
Kelly Wire Die Corp., New York, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Repairs & Re-Cutting
Adamas, Carbide Corporation, Harrison, N. J.
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., New York, N. Y.
Carboloy Co., Detroit, Mich.
Cochaud Wire Die Corp., New York, N. Y.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Hartley Tool & Die Co., Thomaston, Conn.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio.
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., New York, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

DIES—Special Shapes, Etc.
Adamas, Carbide Corporation, Harrison, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Hartley Tool & Die Co., Thomaston, Conn.
Indiana Wire Die Co., Ft. Wayne, Ind.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.

DIES—Swaging
Fenn Manufacturing Co., Hartford, Conn.
Sjogren Tool & Machine Co., Inc., Auburn, Mass.

DIES—Tantalum Carbide
Adamas, Carbide Corporation, Harrison, N. J.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio.

WHERE TO BUY, Continued

Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

DIES—Tube Drawing
Adamas, Carbide Corporation, Harrison, N. J.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Hartley Tool & Die Co., Thomaston, Conn.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

DIES—Tungsten Carbide
Adamas, Carbide Corporation, Harrison, N. J.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Hartley Tool & Die. Co., Thomaston, Conn.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

DRAW BENCHES—
(See MACHINERY—Draw Benches)

DRUMS—Flange Steel
Hubbard Spool Company, Chicago, Ill.

DRUMS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.
Watson Machine Co., The, Paterson, N. J.

DRYING EQUIPMENT—
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.
Ross, J. O., Engineering Corp., New York, N. Y.

ENGINEERS—Consulting
Copper Consultant—Leonard O. Walde Seekonk, Mass.
Galvanizing—Imhoff, Wallace G. Co., The, Los Angeles, Calif.
Metal Fatigue—Fatigue of Materials Laboratory, Princeton, N. J.
Wire Mill—Lewis, Kenneth B., Worcester, Mass.

EQUIPMENT—Insulation Testing
Davis, R. L., Elec. Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FENCING & FENCES—Wire
Interlocking Fence Co., Morton, Ill.

FLUXES—Soldering
American Chemical Paint Co., Ambler, Pa.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin Chemical Company, The, Pittsburgh, Pa.

FRICTION PAY-OFF STANDS—
Industrial Ovens, Inc., Cleveland, Ohio.

FURNACES—Annealing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Holden, A. F., Co., The, New Haven, Conn. and Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engr. Co., Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Automatic
Electric Furnace Co., Salem, Ohio.
Surface Combustion Corp., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Brazing
Electric Furnace Co., Salem, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.

FURNACES—Bright Annealing
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Michigan Oven Co., Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Electric
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Trauwood Engineering Co., The, Cleveland, Ohio.

FURNACES—Galvanizing Equipment
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Hard'ing & Temp'ing
Ajax Electric Co., Inc., Philadelphia, Pa.
Drying Systems, Inc., Chicago, Ill.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland, Ohio

FURNACES—Lead Melting
Electric Furnace Co., Salem, Ohio.
Robertson, John, Co., Brooklyn, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Non-Oxidizing
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Normalizing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Pot (oil, gas, electric)
Ajax Electric Co., Inc., Philadelphia, Pa.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.

FURNACES—Resistance Heating, Strand
Trauwood Engineering Co., The, Cleveland, Ohio.

FURNACES—Salt Bath
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Wire, Strip & Sheet
Carl-Mayer Corp., The, Cleveland, Ohio.
Eisler Engineering Co., Newark, N. J.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Michigan Oven Co., Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

GALVANIZING EQUIPMENT—
Steel Equipment Co., Cleveland, Ohio.
Wean Equipment Corp., Cleveland, Ohio.

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOOKS—Pickling & Liming
Lewis Welding & Eng'g Corp., Bedford, Ohio.
Youngstown Welding & Engineering Co., Youngstown, Ohio.

HOISTS—Electric Travelling
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, Ohio.

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin Chemical Company, The, Pittsburgh, Pa.

INSULATING LACQUERING SYSTEMS—Continuous
American Insulating Machine Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, Ohio.

INSULATING MATERIALS—
Belding, Heminway, Corticelli Co., New York, N. Y.
Glass Fibers Inc., Cleveland, Ohio.
Merrimac Paper Co., New York, N. Y.
New England Lacquer Co., E. Providence, R. I.
Owens Corning Fiberglas Corp., Toledo, O.
Standard Varnish Works, Staten Island, N. Y.
Twitchell, E. W., Philadelphia, Pa.

INSULATING MATERIALS—Paper — For Electric Wire Cable.
Merrimac Paper Co., New York, N. Y.
Twitchell, E. W., Philadelphia, Pa.

LACQUERS—For Electric Wire
New England Lacquer Co., E. Providence, R. I.
Standard Varnish Works, Staten Island, N. Y.

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LATHES—Die Reaming
Carboloy Co., Inc., Detroit, Mich.
Roos, Tool & Mfg. Co., Montclair, N. J.

LIME—
Warner Co., Philadelphia and Bellefonte, Pa.

LININGS—Acid and Alkali Proof
Haveg Corp., Newark, Del.

LOOMS—Weaving Wire Cloth
Bruckner-Mitchell, Inc., New York, N. Y.

LUBRICANTS — For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Fiske Brothers Refining Co., Newark, N. J.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Inc., Chicago, Ill.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Fiske Brothers Refining Co., Newark, N. J.
Swift & Co., Chicago, Ill.

LUMBER—Wire Mill, for lagging and car blocking
North Anson Reel Co., North Anson, Maine.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Barbed Wire
Glader Machine Works, Chicago, Ill.
Wean Engineering Co., Cleveland, Ohio.

MACHINERY—Bead Wrapping
Terkelsen Machine Co., Boston, Mass.

MACHINERY—Braiding
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

MACHINERY—Brazing
Eisler Engineering Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Bunching
American Insulating Mach'y Co., Phila., Pa.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Bundling, Scrap
Fenn Manufacturing Co., Hartford, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Chain Making
Nilson, A. H. Machine Co., The, Bridgeport, Conn.

WHERE TO BUY, Continued

MACHINERY—Cable, Rope Closing
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coilers
Boyd & Sons Manufacturing Co., Phila., Pa.
Eisler Engineering Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
National Machinery Exchange (used), New York, N. Y.
New England Butt Co., Providence, R. I.
Ruesch, H. J. Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.
Wire & Textile Machinery, Inc., Pawtucket, R. I.

MACHINERY—Cold Heading
(See Cold Headers)

MACHINERY—Copper Wire Drawing and Rolling
Aetna-Standard Engineering Co., Youngstown, Ohio.
American Insulating Mach'y Co., Phila., Pa.
Fenn Manufacturing Co., Hartford, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Ruesch, H. J. Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire
American Insulating Mach'y Co., Phila., Pa.
National Erie Corp., Erie, Pa.
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cutting
Eisler Engineering Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio.
Mettler Machine Tool, Inc., New Haven, Conn.
National Mach'y Exch. (Used) New York, N. Y.
Nilson Machine Co., A. H., Bridgeport, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Die Making
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Roos, Tool & Mfg. Co., Montclair, N. J.
Wayne Wire Die Co., Hillside, N. J.
Wickman, A. C., Ltd., Coventry, England.

MACHINERY—Draw Benches
Aetna-Standard Engineering Co., Youngstown, Ohio.
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Edging
Fenn Manufacturing Co., Hartford, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, Ohio.
Michigan Oven Co., Detroit, Mich.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Extruding
National Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
Robertson, John, Co., Brooklyn, N. Y.
Royle, John, & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.
Interlocking Fence Co,, Morton, Ill.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Filament Coil Winding
Eisler Engineering Co., Newark, N. J.

MACHINERY—Flat Wire
Fenn Manufacturing Co., Hartford, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Galvanizing
(See Galvanizing Equipment)

MACHINERY—Galvanizing Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

MACHINERY—Gang Winders
Entwistle, Jas. L. Co., Pawtucket, R. I.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Insulating
American Insulating Mach'y Co., Phila., Pa.
National Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lead Encasing Presses, etc.
Robertson, John Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
Robertson, John Co., Brooklyn, N. Y.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
Bruckner-Mitchell, Inc., New York, N. Y.
Interlocking Fence Co., Morton, Ill.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
Fenn Manufacturing Co., Hartford, Conn.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Material Handling
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MACHINERY—Measuring Wire & Cable
Durant Mfg. Co., Milwaukee, Wis.
Entwistle, Jas. L. Co., Pawtucket, R. I.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Glader, Wm., Machine Works, Chicago, Ill.
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Panning
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Perth Amboy, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Pickling
Chemsteel Construction Co., Pittsburgh, Pa.
Youngstown Welding & Engineering Co., Youngstown, Ohio.

MACHINERY—Pointing
Aetna-Standard Engineering Co., Youngstown, Ohio.
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Poultry Wire Fencing
Interlocking Fence Co., Morton, Ill.

MACHINERY—Rod Mill
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rolling Mill
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J
Torrington Mfg. Co., Torrington, Conn
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rubber Insulating
Royle, John & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Rubber Tubing and Straining
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Screw Wire
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y Co., Phila., Pa.
Davis, R. L. Electric Co., Wallingford, Conn.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
Fenn Manufacturing Co., Hartford, Conn.
New England Butt Co., Providence, R. I.
Ruesch, H. J. Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Mystic, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Spooling
American Insulating Mach'y Co., Phila., Pa.
Boyd & Sons Manufacturing Co., Phila., Pa
Bruckner-Mitchell, Inc., New York, N. Y.
Davis, R. L. Electric Co., Wallingford, Conn.
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
National Mach'y Exch. (Used), New York, N.Y.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

MACHINERY—Spring Making
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Lewis Machine Co., The, Cleveland, Ohio.
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N.Y.
Nilson, A. H. Machine Co., Bridgeport, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio.
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Stranding
Haskell-Dawes Machine Co., Philadelphia, Pa.
Hughesville Machine & Tool Co., Hughesville, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Forming
Wickman, A. C., Ltd., Coventry, England.

MACHINERY—Strip Steel
Aetna-Standard Engineering Co., Youngstown, Ohio.
Fenn Manufacturing Co., Hartford, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Steel Equipment Co., Cleveland, Ohio.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Swaging
Fenn Manufacturing Co., Hartford, Conn.
National Erie Corp., Erie, Pa.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

WHERE TO BUY, Continued

MACHINERY—Testing Physical
Scott Testers, Inc., Providence, R. I.

MACHINERY—Testing Equipment—Sparkers
Davis, R. L. Elec. Co., Wallingford, Conn.
Entwistle, Jas. L., Pawtucket, R. I.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Steel Equipment Co., Cleveland, Ohio.
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Co., Cleveland, Ohio.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.
Fenn Manufacturing Co., Hartford, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
Marshall-Richards Machine Company, Ltd., Trenton, N. J.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Weaving Wire Cloth
Bruckner-Mitchell, Inc., New York, N. Y.

MACHINERY—Welding Wire
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
Bruckner-Mitchell, Inc., New York, N. Y.
Davis, R. L. Electric Co., Wallingford, Conn.
Eisler Engineering Co., Newark, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wind-up (Constant Tension, Variable Speed)
Aetna-Standard Engineering Co., Youngstown, Ohio.
Davis, R. L. Electric Co., Wallingford, Conn.
Fenn Manufacturing Co., Hartford, Conn.
Industrial Ovens, Inc., Cleveland, Ohio.
Marshall-Richards Machine Company, Ltd., Trenton, N. J.
Standard Machinery Co., Mystic, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Bending
Eisler Engineering Co., Newark, N. J.
Kilmer, M. D., & Co., Cleveland, Ohio.

MACHINERY—Wire Drawing
Aetna-Standard Engineering Co., Youngstown, Ohio.
American Insulating Mach'y Co., Phila., Pa.
Fenn Manufacturing Co., Hartford, Conn.
Marshall-Richards Machine Company, Ltd., Trenton, N. J.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio.
Svenska Telegrambyran (Morgardshammer) Stockholm, Sweden
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Wire Forming
Fenn Manufacturing Co., Hartford, Conn.
Kilmer, M. D. & Co., Cleveland, Ohio.
National Mach'y Exch. (Used), New York, N.Y.
Nilson Machine Co., A. H., Bridgeport, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Wickman, A. C., Ltd., Coventry, England.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wood Screw
National Mach'y Exch. (Used), New York, N.Y.

MACHINERY—Wrapping Straight Lengths and Tubing
Angier Corporation, The, Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

MACHINERY—Wrapping Wire Coils
Angier Corporation, The, Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

MATERIAL HANDLING EQUIPMENT
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MILLS—Tandem, Rolling & Edging
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Co., Cleveland, Ohio.

NAILS—Wire
American Steel & Wire Co., Cleveland, Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling, John A. Sons Co., Trenton, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.

OVENS—Cable Lacquering
American Insulating Mach'y Co., Phila., Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio.
Michigan Oven Co., Detroit, Mich.
Morrison Eng'g Corp., Cleveland, Ohio.

OVENS—Dehydrogenizing
Industrial Ovens, Inc., Cleveland, Ohio.

OVENS—Industrial
Drying Systems, Inc., Chicago, Ill.
Industrial Ovens, Inc., Cleveland, Ohio.
Michigan Oven Co., Detroit, Mich.
Morrison Eng'g Corp., Cleveland, Ohio.
Ross, J. O., Engr. Corp., New York, N. Y.

OVENS—Rod Bakers
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Michigan Oven Co., Detroit, Mich.
Morrison Eng'g Corp., Cleveland, Ohio.
Rockwell, W. S. Co., Fairfield, Conn.
Ross, J. O. Eng'g Corp., N. Y., N. Y.

OVENS—Welding Rod Coating
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Industrial Ovens, Inc., Cleveland, Ohio.
Morrison Eng'g Corp., Cleveland, Ohio.
Ross, J. O., Engr. Corp., New York, N. Y.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PANS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

PAPER—Creped Wrapping
Angier Corporation, The, Framingham, Mass.
Crepe-Kraft Company, The, Division National Waterproof Papers, Inc., Newark, N. J.
Terkelsen Machine Co., Boston, Mass.

PAPER—For Coil Wrapping and Corrosion Prevention
Angier Corporation, The, Framingham, Mass.
Crepe-Kraft Company, The, Division National Waterproof Papers, Inc., Newark, N. J.
Terkelsen Machine Co., Boston, Mass.

PATENT ATTORNEYS—
Lancaster, Allwine & Rommel, Washington, D.C.

PICKLING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin Chemical Co., The, Pittsburgh, Pa.

PICKLING—Hooks, etc. Acid Resisting
Lewis Welding & Eng'g Corp., Bedford, Ohio.
Youngstown Welding & Engineering Co., Youngstown, Ohio.

PICKLING TANK LININGS—
Ceilcote Company, The, Cleveland, Ohio.
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corp., Newark, Del.

PLASTIC TESTERS—
Scott Testers, Inc., Providence, R. I.

PNEUMATIC CYLINDERS—
Entwistle, James L. Co., Pawtucket, R. I.

POTS—Lacquer
Industrial Ovens, Inc., Cleveland, Ohio.

POTS—Lead Melting
Robertson, John, Co., Brooklyn, N. Y.

PRESSES—Hydraulic and Mechanical
Robertson, John, Co., Brooklyn, N. Y.
Standard Machinery Co., Mystic, Conn.

PRESSES—Lead
Robertson, John, Co., Brooklyn, N. Y.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry & Mach. Co., Trenton, N.J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.

PUMPS—Hydraulic
Robertson, John, Co., Brooklyn, N. Y.

REEL AND TENSION STANDS—
Davis, R. L. Electric Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I.
Industrial Ovens, Inc., Cleveland, Ohio.
Roll-a-Reel, Cincinnati, Ohio.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

REEL CRUTCHES—
Roll-a-Reel, Cincinnati, Ohio
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Drawn Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Hubbard Spool Co., Chicago, Ill.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp. Niles, Ohio.

REELS & SPOOLS—Collapsible
Entwistle, Jas. L. Co., Pawtucket, R. I.

REELS & SPOOLS—Plastic
Hubbard Spool Co., Chicago, Ill.

REELS & SPOOLS—Steel
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Clark, J. L., Mfg. Co., Rockford, Ill.
Hubbard Spool Co., Chicago, Ill.
Mason Can Company, Providence, R. I.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS AND SPOOLS—Shipping and Shop
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Clark, J. L., Mfg., Co., Rockford, Ill.
Hubbard Spool Co., Chicago, Ill.
Mason Can Company, Providence, R. I.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
North Anson Reel Co., North Anson, Maine.

REELS & SPOOLS—Wooden
Acrometal Products, Inc., Minneapolis, Minn.
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., Inc., The, Hazardville, Conn.
Durkee Mfg. Co., Pine River, Minn.
Nelson Co., The, Baltimore, Md.
North Anson Reel Co., North Anson, Maine.

REELS—Metal Bound
Durkee Mfg. Co., Pine River, Minn.
Hubbard Spool Co., Chicago, Ill.
North Anson Reel Co., North Anson, Maine.

REELS—Takeoff
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Clark, J. L. Mfg. Co., Rockford, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
North Anson Reel Co., North Anson, Maine.

REELS—Vulcanizing & Impregnating
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Wire Drawing
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg., Co., The, Hazardville, Conn.
Durkee Mfg. Co., Pine River, Minn.

WHERE TO BUY, Continued

Hubbard Spool Company, Chicago, Ill.
Mason Can Company, Providence, R. I.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
North Anson Reel Co., North Anson, Maine.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

RESISTANCE HEATING—Annealing Patenting, Etc.
Trauwood Engr. Co., Cleveland, Ohio.

ROD BAKERS—
(See Ovens—Rod Bakers)

RODS—Aluminum
Aluminum Co. of America, Pittsburgh, Pa.

RODS—Nickel Alloy
International Nickel Co., Inc., New York, N.Y.

RODS—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio.

RODS—Wire—Non-Ferrous
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire, Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Wire
American Steel & Wire Company, Cleveland, Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Roebling's John A., Sons Co., Trenton, N. J.
U. S. Steel Export Co., New York, N. Y.

RUBBER AND RUBBER COMPRESSION TESTERS—
Scott Testers, Inc., Providence, R. I.

RUST PROOF COMPOUNDS—
(See Compounds—Rust Preventing)

RUST REMOVING COMPOUNDS—
(See Compounds—Rust Preventing)

SALTS—Heat Treating, Descaling, etc.
Holden, A. F., Company, The, New Haven, Conn. and Detroit, Mich.

SATURATION SYSTEMS—
Industrial Ovens, Inc., Cleveland, Ohio.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc., Pawtucket, R. I.

SOAPS—Industrial and Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Fiske Brothers Refining Co., Newark, N. J.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H. Co., Inc., Homer, N. Y.
Potter, Neil Co., Newark, N. J.
Standard Industrial Compounds Co., Inc., Chicago, Ill.
Swift & Company, Chicago, Ill.

SOLVENT RESIN SYSTEMS—Experimental
Industrial Ovens, Inc., Cleveland, Ohio.

STAMPINGS—Steel
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Roebling's, John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

SWIFTS—Take-off
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Watson Machine Co., Paterson, N. J.

TANKS—Compound
Ceilcote Company, The, Cleveland, Ohio.
Haveg Corp., Newark, Del.
Watson Machine Co., Paterson, N. J.

TANKS—Pickling
Ceilcote Co., The, Cleveland, Ohio.
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corp., Newark, Del.

TANKS—Steel
Chemsteel Construction Co., Pittsburgh, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

TINSEL—Cords, Decorative
(See: Tinsel—Electric Conductor)

TINSEL—Electric Conductor
Montgomery Co., The, Windsor Locks, Conn.

TINSEL—Electric Resistance
(See: Tinsel—Electric Conductor)

TINSEL—Lame, Silver and False Gold
(See: Tinsel—Electric Conductor)

TINSEL—Thread, Silver and False Gold
(See: Tinsel—Electric Conductor)

TINSEL—Thread, Decorative
(See: Tinsel—Electric Conductor)

TINSEL—Wire
(See: Tinsel—Electric Conductor)

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRAVERSES—For Reels
Entwistle, James L. Co., Pawtucket, R. I.
Hubbard Spool Company, Chicago, Ill.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

TRAVERSE MECHANISMS—
Apco Mossberg Co., Attleboro, Mass.
Fenn Manufacturing Company, Hartford, Conn.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc., Pawtucket, R. I.

TUBE BENDERS AND FORMERS—
H. D. Kilmer Co., Cleveland, Ohio.
Ruesch, H. J., Machine Co., Newark, N. J.

TURKS HEADS—
Fenn Manufacturing Co., Hartford, Conn.

VALVES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

VARNISHES—For Insulation
Standard Varnish Works, Staten Island, N. Y.

VULCANIZERS—
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

WEAVING—Industrial Wire Cloth
Bruckner-Mitchell, Inc., New York, N. Y.

WELDERS—Spot and Butt
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.

WIND-UP AND UNWIND SYSTEMS—Continuous
American Insulating Mach'y Co., Phila., Pa.
Davis R. L. Electric Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I.
Industrial Ovens, Inc., Cleveland, Ohio.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

WIRE—Aluminum
Aluminum Co. of America, Pittsburgh, Pa.
Malin & Co., Cleveland, Ohio.

WIRE—Barbed
Interlocking Fence Co., Morton, Ill.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
American Steel & Wire Co., Cleveland-Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Electric
Malin & Co., Cleveland, Ohio.

WIRE—Flat, Fine
Montgomery Co., The, Windsor Locks, Conn.

WIRE—Manufacturers
American Steel & Wire Co., Cleveland-Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Molybdenum
North American Philips Co., Inc., New York, N. Y.

WIRE—Music
American Steel & Wire Co., Cleveland-Chicago, New York.
Columbia Steel Co., San Francisco, Calif.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., Cleveland, Ohio.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Webb Wire Works, The, New Brunswick, N. J.

WIRE—Nickel & Nickel Alloy
International Nickel Co., Inc., New York, N. Y.

WIRE—Nickel Silver and Phosphor Bronze
Malin & Co., Cleveland, Ohio.

WIRE—Non-Ferrous to Specifications for Special Purposes
No. American Philips Co., Inc., N. Y., N. Y.

WIRE—Spring
American Steel & Wire Co., Cleveland-Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Webb Wire Works, The, New Brunswick, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Co., Cleveland-Chicago, New York.
Columbia Steel Co., San Francisco, Calif.
Firth Sterling Steel & Carbide Co., McKeesport, Pa.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
U. S. Steel Export Co., New York, N. Y.
Webb Wire Works, The, New Brunswick, N. J.

WIRE—Steel—Also Coppered Steel—Also Galvanized Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Straightening and Cutting
Pittsburgh Cut Wire Co., Pittsburgh, Pa.
Wickwire Brothers, Inc., Cortland, N. Y.

WIRE—Tungsten
North American Philips Co., Inc., New York, N. Y.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WIRE CLOTH—Industrial
Roebling's, John A., Sons Co., Trenton, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.

WRAPPING PAPER—Creped
Angier Corporation, The, Framingham, Mass.
Crepe-Kraft Company, The, Division National Waterproof Papers, Inc., Newark, N. J.

YARNS & TAPES—
Belding, Heminway, Corticelli Co., New York, N. Y.
Glass Fibers Inc., Cleveland, Ohio.
Owens Corning Fiberglas Corp., Toledo, Ohio.
Twitchell, E. W., Philadelphia, Pa.

YARN TESTERS—
Scott Testers, Inc., Providence, R. I.

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ELECTRICAL WIRE AND CABLE, WIRE ROPE AND CORDAGE MACHINERY

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The Most Compact, High Production, Low Cost, Vertical Unit in World-Wide Use.

AN IDEAL PRODUCER OF CORD CORES, ANTENNA WIRES, METAL FISH LINES, TWISTED INSULATED CONDUCTORS AND STRAND OF ANY METAL OR LINEAR PRODUCT ABLE TO ABSORB TORSION.

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1800 TWISTS Per Minute

STANDARD No. 7 16" x 8" x 8" TAKEUP REELS

TWO LAY RANGES 30 POSSIBLE LAYS From 1/8" to 2 1/4"

DETACHABLE and INTERCHANGEABLE CAPSTAN - DRIVE - UNITS Allow Rapid Changes of Lay Range and Hand of Twist

WIRE FEED FROM ANY DIRECTION

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* * *

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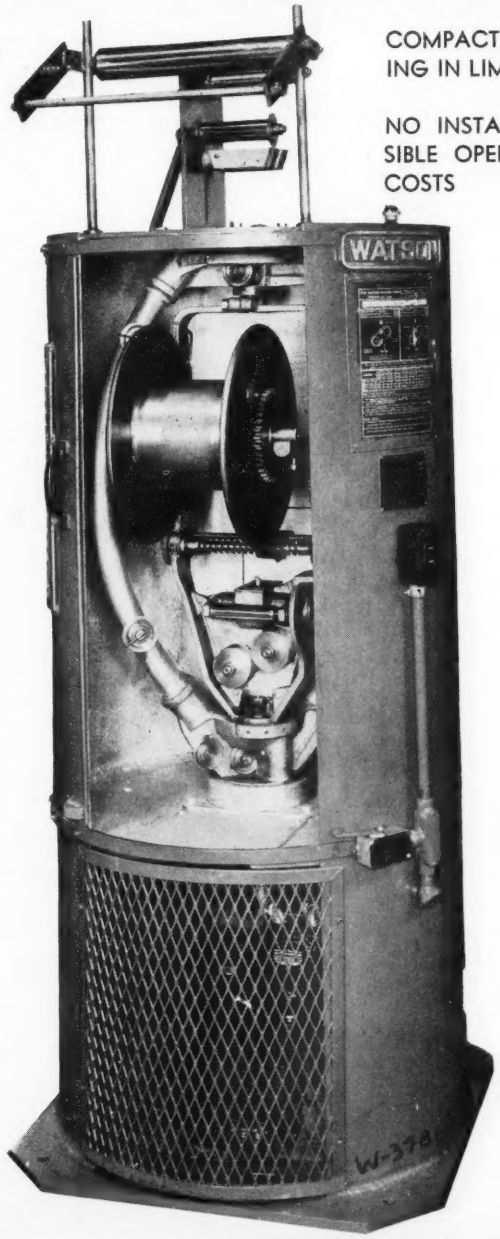

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BASE ONLY 32" x 32"

ALL STEEL and BALL BEARING CONSTRUCTION

FULLY GUARDED MECHANISM IN TUBULAR MACHINE FRAME

ELECTRIC STOP DOOR SAFETY

FULLY AUTOMATIC "CURRENT OFF" BRAKE

ADJUSTABLE MULTI-DISC SLIP FRICTION

OIL HOUSED GEARING

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Net	1200#
Skidded	1300#
Crated	1450#
Boxed (150 cu. ft.)	1750#

* * *

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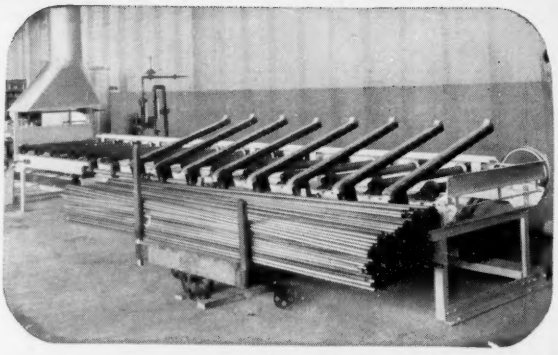
Continuous Annealing subjects the entire length and width of the strip to same time and temperature treatment, greatly improving drawing qualities.



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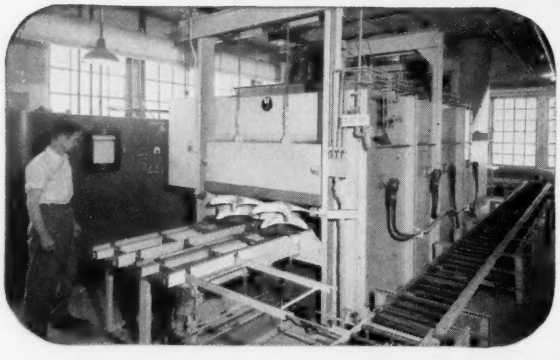
Clean Annealing Wire in an EF gas fired recuperative radiant tube type special atmosphere continuous roller hearth furnace. Handles coils up to 30" diameter.



Brazing and Heat Treating operations are carried out in above furnace. Other interesting installations are shown in Bulletin No. 461. Send for copy.

EF BUILDS A SIZE AND TYPE FURNACE FOR *every* HEAT TREATING REQUIREMENT

● Whether yours is a ferrous or non-ferrous annealing, brazing, forging or other heating or heat treating problem—there's an EF furnace to take care of your specific requirements. EF builds all types—in sizes for most any production—oil-fired, gas-fired or electrically heated. Consequently we can recommend *without prejudice* the design, the size and the method of firing that suits *your particular problem—best.*

For uniform, efficient, low-cost operation and results it will pay you to investigate recent EF developments—the results of over 30 years of furnace building experience. Call in an EF engineer on your next furnace problem.

Write for Bulletin 461. It illustrates 17 sizes and types—and describes each briefly.

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GAS FIRED, OIL FIRED AND ELECTRIC FURNACES
FOR ANY PROCESS, PRODUCT OR PRODUCTION

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